



MICHIGAN DEPARTMENT OF TRANSPORTATION

**State Long-Range Transportation Plan
2005-2030**

**Land Use
Technical Report**

*Prepared by
The Michigan Department
of Transportation
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With assistance from



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MI Transportation

MICHIGAN LONG RANGE TRANSPORTATION PLAN

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Executive Summary

This *Land Use Technical Report*, prepared as part of the *MI Transportation Plan*, provides an overview and discussion of Michigan land use trends and issues. It addresses Michigan's historical development patterns, current and developing problems and opportunities, and how land use issues affect and integrate with the transportation system. It presents best practices and examples of land use tools applied by other state DOTs that may be applicable to and complement those that the Michigan Department of Transportation (MDOT) may already be doing.

The report suggests that in addition to the need for coordination, evaluation of transportation problems requires focusing on land use and access in addition to mobility and safety. By physically moving people and services closer together, more transportation modal options could be feasible. In-fill housing, live-where-you-work programs, brownfield redevelopment and developing shopping, schools, and other service-oriented facilities within walking and bicycling distance can all reduce transportation demand; particularly demand for single-occupant vehicular travel. Examples of land use and transportation practices from other states are presented to provide MDOT with information and ideas that can supplement and enhance integrated planning efforts already underway in Michigan.

Chapter 1. Purpose and Introduction

This *Land Use Technical Report* is one of 17 technical reports prepared as background and support for *MI Transportation Plan*. This report provides an overview and discussion of Michigan land use trends and issues. It addresses Michigan's historical development patterns and how land use issues affect and integrate with the transportation system. It presents best practices and examples of land use tools applied by other state DOTs that may be applicable to Michigan.

1.1 Land Use and Transportation Policy Connection

The Michigan Department of Transportation (MDOT) recognizes that land use patterns affect transportation choices and transportation opportunities impact land use decisions. This report discusses and provides examples of how land use and transportation policy are connected and that transportation decisions affect land use. It identifies ways that Michigan and MDOT can adapt its policies and programs and develop and implement tools to impact land use decisions and help achieve the goals of *MI Transportation Plan*.

1.2 Overview of Technical Report

This report includes seven chapters. Data used in the preparation of this report, and some of the discussion relative to impacts and implications presented in this report, came from a number of the other reports prepared for *MI Transportation Plan*. Two of these include the *Socioeconomic Technical Report* and *MPO/RPA Technical Report*. **Chapter 2, Historic Land Use Development Patterns** provides a historical perspective of the relationship between transportation and land use patterns. **Chapter 3, Land Use-Transportation Relationship** presents an overview of Michigan's land use trends and their relationship to transportation. **Chapter 4, Transportation/Land Use Planning Integration: Issues and Considerations** discusses the issues and implications of Michigan's demographic, socioeconomic, employment, inter-governmental, and residential pattern changes to transportation and land use. **Chapter 5, Land Use and Transportation Practices from Other States** summarizes 30 tools, methods, strategies, and procedures along with implementation examples, that state DOTs and MPOs use to integrate transportation planning and land use. It also presents examples of some of the notable programs and approaches used that are potentially transferable to Michigan. **Appendix A** presents a complete listing of the tools and examples from the Federal Highway Administration (FHWA) Web site. **Chapter 6, Findings and Conclusions** discusses land use and transportation coordination, implications, and options for incorporating policies and investments that support integrated planning into *MI Transportation Plan*. Finally, **Chapter 7, Integration** discusses land use and transportation integration issues.

Chapter 2. Historic Land Use Development Patterns

Michigan's land development locations and patterns reflect the historical availability of and technological advances in transportation. Historically, people traveled first by foot, then water and animal-power, then rail, trolley, bicycle, automobiles, and, finally, by air. The extent of use and popularity of each of these modes is a function of several factors and forces. Some of these include the availability of infrastructure supporting the mode, the safety and ease of travel, the ability to access the mode and to have the mode get them to their desired destination, the time needed to travel on the mode to reach the desired destination, and the cost to travel on the mode. In turn, factors such as the availability and cost for each of these modes and the freedom of choice provided by the mode, has had a synergistic relationship to land development patterns in Michigan.

2.1 Early Civilization Patterns and Transportation

Michigan's first settlements were the Indian villages of the Ojibwa, Ottawa and Potawatomi Native Americans. Travel was by foot, horseback, or on one of Michigan's waterways. Native American trails followed the lakeshores, streambeds, and the flat terrain between the hills and generations of these people laid out villages along the lakes or trails.

The first Europeans to enter the area were the French and French-Canadians in the early 1600s and 1700s, followed by the British in the 1700s. During the early 1600s, French explorers and settlers located their early settlements along the Great Lakes so that people and goods could be shipped in and out.

As more settlers came, missions and forts were located along the lakes. In 1668, the first mission was established at Sault Ste. Marie; Detroit was founded as Fort Pontchartrain in 1701. In 1715, the French established Fort Michilimackinac at the Straits of Mackinac. By 1779, nearly 3,000 settlers were living in the Detroit area. By 1810, the population of the Michigan Territory was 4,762 including 32 slaves (most of whom were Native Americans). Over time, the forts, missions, and settlements were connected with trails and evolved into roadways and population centers, many of which still exist today.

2.1.1 Waterways / Great Lakes - Passenger and Freight

As early as the late 1600s, sailing ships navigated the Great Lakes. History records the Griffon as the first sailing vessel on the Great Lakes. In 1679, it was lost in a storm on Lake Michigan. In 1818 the first steamboat, Walk-in-the-Water, arrived in Detroit.

In 1820, the population of the Michigan Territory was 8,096 with Detroit, Mackinac, and Sault Ste. Marie as the largest towns. All were located on Great Lake shores. From 1812 to 1825, development was slow. However, with the opening of the Erie Canal in 1825, a flood of immigrants from New York and New England began arriving. In 1836, shipbuilding became important along rivers and lakeshores. During seven months of navigation, 200,000 people passed through Detroit's port. During the 1840s, copper and iron ore were discovered in the

Upper Peninsula and transportation by water was the primary method of transporting materials to markets. The combination of natural resources, employment, and transportation fueled immigration to Michigan. The state's population, which stood at 8,096 in 1820, was nearly 400,000 by 1837.

On June 22, 1855, a ship canal at Sault Ste. Marie opened, and the passage of the steamer Illinois through the locks marked the opening of unobstructed shipping between Lakes Superior and Huron. Ships no longer needed to stop and portage their cargo around the rapids of the St. Mary's River, which drops 12 feet from Lake Superior to Lake Huron. This mile-long canal and its 350-foot locks provided new impetus to Michigan's mining industry. In 1888, Michigan's lumber boom peaked with shipments of 4.3 billion board feet. Iron ore shipments from Escanaba also reached 1.1 million tons. The majority of the population lived along these lakeshore and river-based communities, and land developed along with the population and near the natural resources that were extracted.

2.1.2 Railroads – Passenger and Freight

In the 1800s, railroads opened the West to the Eastern US. Fast-growing urban centers began to develop around railroad transportation hubs throughout the country. In 1833, the first horse-powered railroad reached Adrian, Michigan from Toledo. In 1836, the first steam locomotive in Michigan was put into operation as the first railroad west of New York State. Growth and land development in Michigan began to shift away from the lake and river shores to along the rail lines. Still, land development patterns were concentrated within a day's walk or horse's ride to a railroad, river, or lakeshore.

Through the latter half of the 19th Century, rail began to replace water as a primary means of transportation for people and goods. In 1855, the Detroit & Milwaukee Railroad completed their line connecting Detroit and Grand Haven; in 1859, the Grand Trunk Railroad opened from Detroit to Port Huron. In January 1877, Winfield Scott Gerrish opened the 7.1-mile Lake George and Muskegon River Railroad and moved 20 million board feet of logs to the Muskegon River. In 1870, Michigan's population was approaching 1.1 million. By 1882, 32 logging railroads operated in the state. These railroads allowed year-round logging and attracted immigrants from around the world. In 1881, railroad ferry service connected the Upper and Lower Peninsulas. In 1891, a railroad tunnel linked Port Huron, Michigan and Ontario under the St. Clair River. As rail expanded throughout the state, land development patterns in Michigan increasingly focused around rail lines. Rail expansion also opened up Michigan's interior for the growth of agriculture in the state.

By 1905, there were 1,776 railroad depots in Michigan. In 1909, railroad mileage in Michigan reached its peak with 9,059 miles in operation. Cities and towns grew and developed around rail lines and depots and offered jobs and safe, reliable and inexpensive transportation for Michigan's growing population and commodities. Although roads connected the early urban centers, until the mid-1900s and the development of the automobile and the modern highway system, most people lived where they worked, inside the urban core, an area typically less than three miles in radius.

Figure 1 shows the location of early rail lines and the location of early towns and cities.

Figure 1: Michigan Railroad Map 1876



During the 20th century, the automobile and trucks replaced rail and water as the travel mode of choice for Michigan's people and goods. Today, only about 4,000 miles of active rail freight lines and three Amtrak passenger rail routes remain in Michigan. Changes in land development patterns followed the changes in mode of choice.

2.1.3 Highways – Automobile, Transit, Freight

Early trails, carved out by Native Americans and traveled by them for generations, became the skeleton of both Michigan's early pioneer roadways and its current highway system. As early as 1822, public stagecoaches were documented as following these trails. In 1824, the US Congress appropriated \$10,000 to survey the Great Sauk Trail (now US-12) between Detroit and Chicago. By 1836, daily stagecoaches carrying mail and passenger were running from Detroit to Sandusky, OH, Chicago, and central Michigan.

In 1896, the first gasoline powered automobiles were test driven in Michigan. In 1899, Olds Motor Works in Detroit erected the first US factory to manufacture automobiles. In 1904, Buick Motor Company began manufacturing in Flint. In 1908, Ford Motor Company introduced the Model T and, by 1914, 78 percent of the nation's automobiles were produced in Michigan. People in Michigan and throughout the US embraced the convenience, flexibility, and freedom that the automobile provided.

As use of roadways grew, government began to accept responsibility for the roadways. In 1905, Michigan organized the State Department of Highways. In 1909, the world's first mile of concrete road was laid in Detroit. In 1925, Michigan introduced the first state gasoline tax of two cents per gallon. By 1942, the automobile was so popular in Michigan that a four lane divided expressway was built in only 11 months to carry workers to the Ford Motor Company. By 1950, Michigan's population had grown to 6,371,766. In addition, as a sign of how the automobile was becoming the travel mode of choice, the National Defense and Interstate Highway System (Interstate System) received US Congressional approval in 1956. Michigan was the first state to complete a border-to-border interstate with the completion of Interstate 94 (I-94) in 1960. The last four miles of I-69 were completed in 1992, bringing Michigan's Interstate System to 1,241 miles. In 1955, Michigan also built the nation's first freeway-to-freeway interchange.

2.1.3.1 Public Transit

Public transit was by horsecar in Michigan until the introduction of the electric trolley in the 1890's. All cities of any size had street railways, including some small ones. Most trolley lines were private firms given franchises by city governments. Some lines were purchased by city governments, most notably Detroit's. A network of rural electric interurbans flourished briefly across southern Michigan between 1910 and 1930, providing a low-cost alternative to steam railroads until rendered unprofitable by autos and highways.

The trolley permitted the first wave of suburban home ownership, and simultaneously permitted assembling hundreds of thousands of workers for the factories of the automobile age. The industrialization of Michigan would not have been possible without the trolley car and its associated pattern of land use, with routes every few blocks lined with apartments and retail, and dense residential neighborhoods in between.

The streetcar remained dominant until the 1920's when families began to own automobiles in large numbers, impelling an even larger wave of suburbanization and home purchase.

Public transit's share of person trips began a steep, steady decline that continues to the present. Street railways were abandoned in all Michigan cities beginning in the 1930's, owing to the cost of track and overhead maintenance, inflexibility of routes, and competition with automobiles for road space. Michigan's last streetcar was replaced by buses in Detroit in 1956.

Many urban bus lines were operated by private firms, but all became unprofitable and were abandoned by the early 1970's. Several Michigan cities were without public transit until state and federal subsidies were begun after 1972.

Today, Michigan has a widespread program of public transit (bus) service providers across the state. The state's 79 local public transit systems, 40 specialized service providers, and their subcontractors are the backbone of this network. All 83 Michigan counties are served by one or both of these services, with over 86.6 million passenger trips in 2004. The 20 urban systems are usually grouped in the following way: the three systems that serve the Greater Detroit Urbanized Area are similar in size and scope (and belong to the same federal funding program); the 16 systems that serve Michigan's other urbanized areas are all funded by the same federal program and are usually grouped together; and the 71 non-urban (or rural) transit systems in Michigan, of which 12 also operate in urban areas.

Urban fixed-route systems play a critical role in Michigan's economy by enabling workforce participation for transit-dependent segments, as well as increasing accessibility to jobs and markets for households with limited auto availability. While auto ownership per household has increased, workforce commuting remains an important trip purpose and a critical function of urban fixed-route systems. Integration of transit will increasingly entail services to ex-urban areas and areas spanning county or other jurisdictional boundaries. Providing transit services for this changing market is an ongoing challenge as current land use development patterns continue to make traveler origin and destination points increasingly dispersed, a situation that undermines the ability to plan and operate a useful and cost-effective public transit network.

2.1.3.2 Freight Movement

As Michigan's highway system grew, the ability to move freight and goods efficiently throughout the state also grew. Today, Michigan closely mirrors the national modal split profile with 70.5 percent of its freight tonnage moving by truck, which equates to 86.0 percent by value. Trucking accounted for nearly 474 million tons of commodity movements in, out, within, and through Michigan in 2003, with an estimated value exceeding \$1 trillion. The heavy dependence of the US economy upon the trucking industry has also contributed to increasing congestion on state and national highways. Major interstates I-75 and I-94 have the greatest truck volumes. I-75 between Detroit and Toledo, Ohio carries an average of 16,000 trucks a day. I-275/I-96, near Livonia and Novi, carries over 15,000 and I-94, near Benton Harbor, averages over 14,000 per day.

As freight and goods volumes, and trucking in particular, have grown, so have freight service providers' need for reliable and fast access to important transportation corridors.

For freight system users and operators to reach suppliers and consumer markets, efficient access to transportation options and freight facilities (e.g., warehouses, distribution centers, rail terminals, intermodal yards, air cargo ramps, and other facilities) is most important, and frequently dictates where and how they seek to locate. Therefore, the safety and efficiency of localized roadway connections to intermodal facilities as well as to warehouses and major distribution centers is critical to ensuring an integrated system that functions to support freight efficiencies.

2.1.4 Air, Telecommuting

Air travel is also a part of Michigan's transportation history. Aviation technology also is part of Michigan's future potential economic growth. In 1922, airline service was instituted between Detroit and Cleveland. In 1928, the first all metal dirigible was constructed for the Navy by Detroit manufacturers and successfully flown at Grosse Ile Airport. Today Michigan has 236 public-use airports. Michigan's 18 commercial airports handle more than 40 million passenger enplanements per year. Because the cost to fly for both people and goods is higher than to travel by automobile or other modes, air services are located in populated areas. Air travel is the mode of choice if the destination is far and if the time or the time reliability is important. Airports are typically located on an urban fringe because of the noise they generate and their need for air space and for aircraft operations. Over time, development often closes in on airports. Land use and transportation patterns surrounding airports are typically driven by the need to provide or improve roadway, transit, or rail service to an airport.

Telecommuting is one of the newest modes of travel – or non-travel. While the option and opportunities to work from home exist, the number of people making this choice has remained small for decades. Telecommuting can however, affect land use patterns since where people can live and where they work does not need to be close, or even within the same state. According to the US Census, only 2.5 percent of Michigan workers worked at home in 1990 and only 2.8 percent worked at home in 2000. As the Internet continues to evolve, as the price of gasoline rises, and as congestion worsens, people may choose to telecommute rather than change the locations of their homes and other life-style choices.

2.1.5 Impact of Transportation Development on US Urban Areas

During the 1800s and early 1900s, technological innovations poured forth, many with profound impacts on urban form of America's cities. Railroad tracks were driven into the heart of the city. Internal rail transportation systems greatly expanded the radius of urban settlement: horsecars beginning in the 1830s, cable cars in the 1870s, and electric trolleys in the 1880s. The industrial city still focused on the city center, which contained both the central business district, defined by large office buildings, and substantial numbers of factory and warehouse structures. Both trolleys and railroad systems converged on the center of the city, which boasted the premier entertainment and shopping establishments. The working class lived in crowded districts close to the city center, near their place of employment.

During the Industrial Revolution of the 1800s, the increasing crowding, pollution, and disease of the central city produced a growing desire to escape to a healthier environment in the

suburbs. The upper classes had always been able to retreat to homes in the countryside, and beginning in the 1830s, commuter railroads enabled the upper middle class to commute into the city center. Horsecar lines were built in many cities between the 1830s and 1880s, allowing the middle class to move out from the central cities into more spacious suburbs. Finally, beginning in the 1890s, electric trolleys and rapid transit lines proliferated, providing cheap urban transportation for the majority of the population and enabling the beginning of migration to the suburbs.

The immediate post-World War II years also spawned the baby boom generation born between 1946 and 1964, the largest generation in US history. Freeway building after World War II opened up even larger areas of suburban land, and tracthouse suburbia exploded immediately in tandem with the baby boom. The 1950s and 1960s were decades of record home building, with family-raising housing production continually moving toward the regional periphery as inlying core counties became fully developed. Various additional dynamics came into play that further encouraged residential and business growth in the ex-urban rural areas: increasing income; low gasoline prices; racial tension; improved suburban infrastructure and amenities; state and federal subsidies for sewers, roads, and commercial development; and a general desire of many people to leave the older, crowded, urban cores to live and work in the relatively open space and privacy offered in suburbia.

As the 1970s commenced, the baby boom itself began to enter the housing market in full force. The first generation born and raised in suburbia overwhelmingly chose to live where they came of age. Apartment, condominium, and town house development emerged as the baby boom formed households and the urbanization of the suburbs commenced in full force. A new, more complex suburban reality replaced the older suburban ideal.

In the 1980s, the baby boom started to reproduce itself, resulting in a very potent baby boom echo (the cohort born between 1977 and 1995). The “stroller people” once again invaded the suburbs as the baby boom drove another era of single-family home production. Then, in the post-recession 1990s, the baby boom reached middle age, yielding a burst of “McMansion” building as the “starter castle” became a visible symbol of the baby boom’s affluence and peak-earning-power years. Maturing baby boom households, now in the child-rearing stage of the life cycle, dominated the housing market. Trade-up, family-raising shelter was in great demand, and a huge web of trade-up markets emerged. Sprawl arrived in full force and in full size. As this trend continues to play out in Michigan, the rate at which the state’s open land is being converted to residential and commercial use outstrips the rate at which the state’s population is increasing by about eight to one.¹

¹ Discussion of post-WWII development patterns excerpted from Hughes, J. and Seneca, J., *The Beginning of the End of Sprawl?*, Issue Paper 21, Edward J. Bloustein School of Planning and Public Policy, Rutgers University, May 2004; and Ellis, C., “History Of Cities And City Planning” (www.art.net/~hopkins/Don/simcity/manual/history.html).

Chapter 3. Land Use - Transportation Relationship

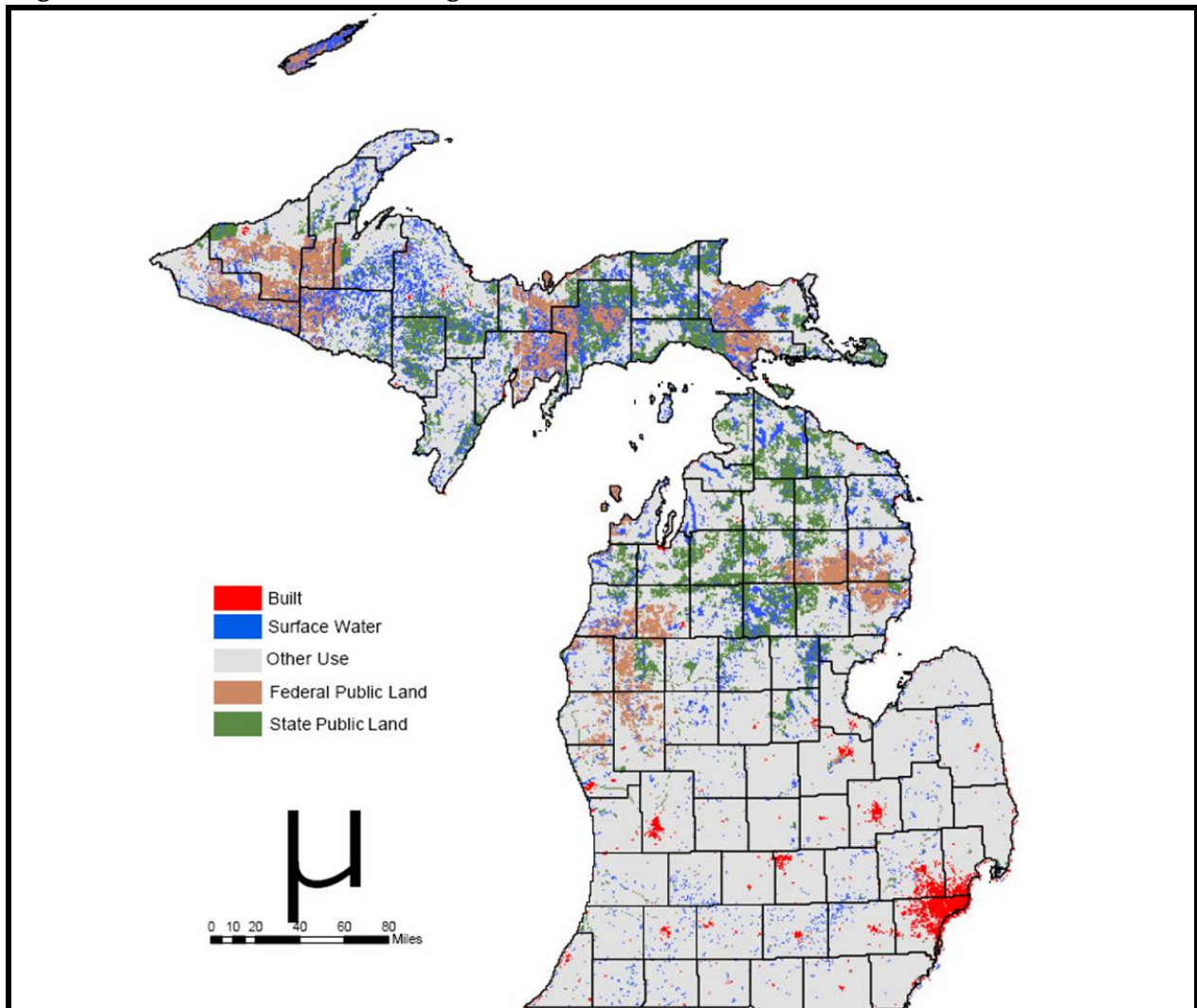
Michigan has nearly 37 million acres of land and 10 million inhabitants. On any globe or from any orbiting spaceship, Michigan's place on Earth is obvious. The Great Lakes vividly outline the state. Within its borders exist major industries, magnificent forests, beautiful farms, residences, and recreational areas. The last time (1978) state land was comprehensively inventoried and classified, 37 percent of the state was upland forestland, 29 percent was agricultural, 17 percent was wetland/lowland forest, and 6 percent was in urban uses (Smyth, 1995). Other smaller categories of use accounted for the balance.

3.1 Statewide Trends

Michigan development patterns have been similar to those in much of the country. Land development began by concentrating near water, then rail lines and most recently around highways. Like much of the US, with increasing personal wealth and the increasing modal shift to the automobile in the mid to late 1900s, notable land use changes have taken place in Michigan. Most notable is the spreading urbanization. This resulted both from rural residents moving closer to the cities for job opportunities and from people moving to suburbs from parts of the older urban core.

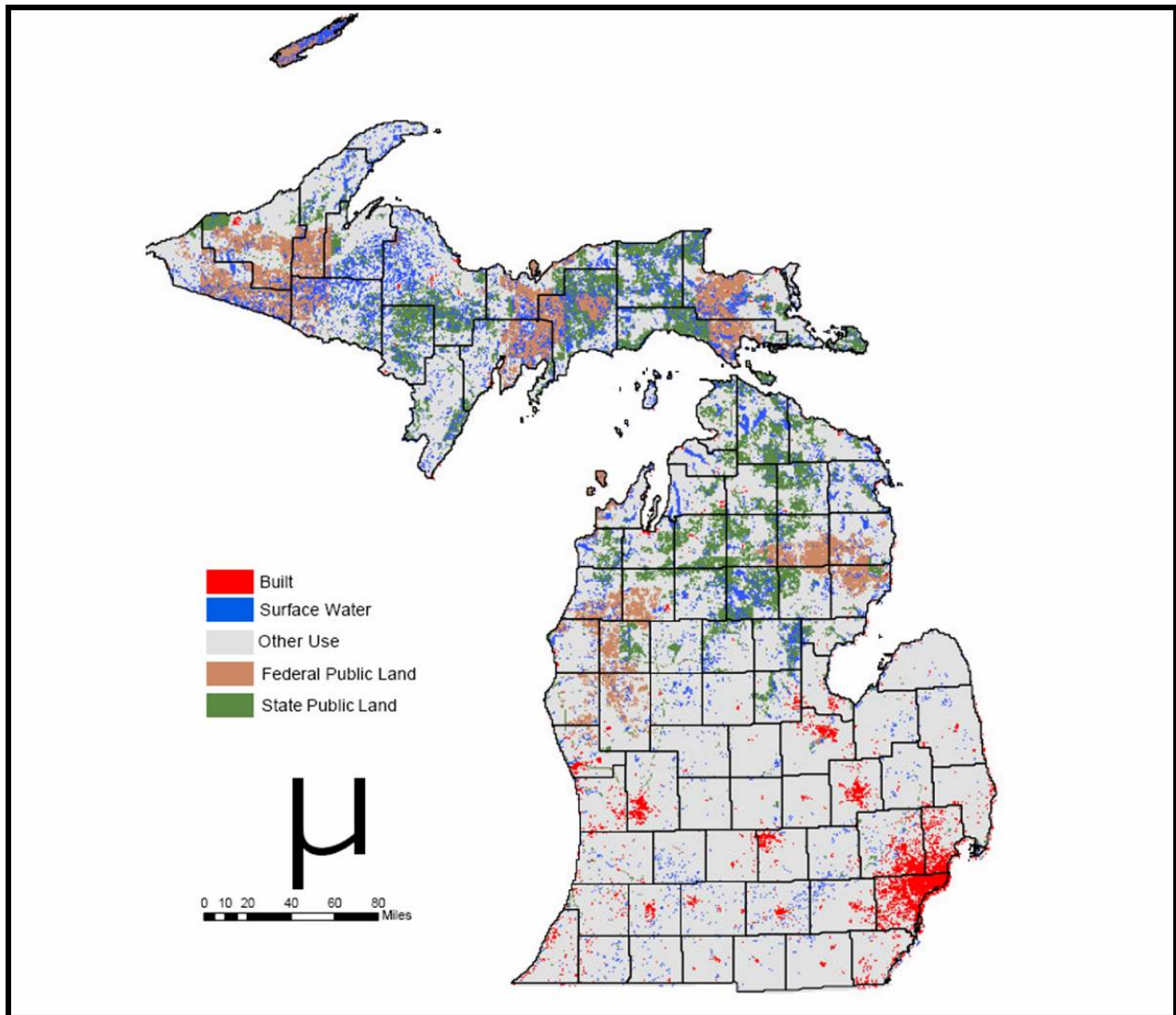
According to the 2001 Michigan Land Resource Project study, as shown in **Figures 2 and 3**, if current land use patterns continue, between 1.5 and 2 million more acres of land area will be urbanized in 2020. This is a 63–87 percent increase over 1990 levels and is as much land as served 9.2 million residents in 1978 (MSPO, September 1995, *Demographics*). The 2001 Michigan Land Resource Project study also projected that if current land use patterns continue, by 2040, Michigan's built or developed areas will increase by 178 percent (PSC 2001). That would mean that 17 percent of Michigan would be developed, compared to the present 9 percent.

Figure 2: Built Land Area in Michigan, 1980



Source: Final Report, MI Land Resource Project, 2001

Figure 3: Built Land Area in Michigan, 2020 Projected



Source: Final Report, MI Land Resource Project, 2001

Some of the most significant effects will be felt in the land resource-based industries and older urban areas. **Table 1** shows land use classifications with actual acreage for 1980 and projections to 2040.

Table 1: Classes of Land Use, 1980 and Projections to 2040

<i>Class of land use</i>	<i>1980 (millions of acres)</i>	<i>Percent of Total</i>	<i>2040 (millions of acres)</i>	<i>Percent of Total</i>	<i>Change (millions of acres)</i>
Agriculture	11	30.4%	9.1	25.1%	-1.9
Built	2.3	6.4%	6.4	17.6%	4.1
Private forestland	18.2	50.3%	16.9	46.6%	-1.3
Other vegetation	2.9	8.0%	2.2	6.1%	-0.7
Wetland	1.8	5.0%	1.7	4.7%	-0.2

Source: Public Sector Consultants, Michigan Land Resource Project, November 2001

As these trends continue, Michigan's population density is falling. Michigan's average population density was 3.8 persons per acre in the early 1980s and dropped to 2.8 persons per acre by the late 1990s (Norris and Soule 2003).

In 2001, the Michigan Land Resource Project also explored the future of Michigan's land-based industries if present development trends continue. The conversion of agricultural land and other vegetative land to developed land has implications for land-based industries such as agriculture, mining, forestry, and natural resource-based recreation and tourism, which collectively account for approximately 30 percent of Michigan's total economy. In the next 40 years, if the current development rate continues, Michigan will have 25 percent less orchard land, 15 percent less farmland, and 8 percent less forestland. The state's destination resorts, particularly those in northern Lower Michigan, find themselves competing with encroaching development along the travel corridors that lead to them (tourism experts find that part of the attraction of a destination resort is enjoying the aesthetics of "getting there").

These development patterns have been made possible by the availability and affordability of personal automobiles and a very good and extensive highway system. As the population moved outward, and densities decreased, the desire for a personal automobile increased and providing public transportation alternatives became more challenging. Following the population, the sources and destinations for commodities has also shifted with the development patterns to locations along the highways.

There are many costs associated with Michigan's growth patterns: agricultural land and open space are developed; traffic congestion increases and new public infrastructure is built on the urban fringe. Urban core areas often have existing infrastructure (especially the road network) that still requires maintenance even when their population declines. The resultant lower tax base from which to fund this maintenance work is particularly challenging for older urban core areas. Furthermore, the localized nature of planning in the state, with land use decisions fragmented across over 1,400 local units of governments, contributes to unbalanced land use

decisions. This arrangement makes it very difficult to implement coherent policies in areas with regional implications, such as housing, transportation or environmental protection.

3.2 Regional Trends

Land use change in Michigan is an increasingly important issue confronting a range of stakeholders and policy-makers at all levels of government. The sprawl issue, as discussed above, is often seen as having positive economic growth and development benefits. In metropolitan areas, however, it is also related to negative impacts of poverty and social equity, while in rural areas it involves the irretrievable loss of farms, rural livelihoods, and open space. This problem has been referred to as the “Inside-Outside Game,” in reference to the two features of sprawl: loss of livable central cities and increased landscape and political fragmentation in the suburban and rural fringe.

While rural areas on the urban fringe give way to residential and commercial development, urban centers experience declining employment opportunities. Less moderate-income housing becomes available, resulting in an increased concentration of poverty in the center cities. Characterized by low-density development, the spatial construction of sprawl also leads to increased travel distances and more time spent on the road getting to and from the work place, retail centers, and recreation. In addition, the ever-expanding beltway surrounding the central city results in increased expenditures for roads and other infrastructure development.

This general problem is often referred to as decentralization, in which many local government authorities assume a larger role than that of central metropolitan governments, and where, at least at present, there are few or no regional or statewide governance structures to manage and mitigate the pace, location, and impact of sprawl. While not yet widely seen in Michigan, in other parts of the country this has resulted in a metropolitan region with many independent “boomburbs,” with their own planning governments, disconnected from each other and the region.

3.3 Urban / Activity Center Trends

Disinvested urban cores frequently have numerous properties on which there are dilapidated and/or abandoned structures and/or environmental contamination from past uses. These are referred to as brownfields (abandoned, idle, or under-used industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination). Such properties cannot be reused until they are cleaned up, which may be very costly. Despite this obstacle, in the 1990s Michigan became a national model in brownfield redevelopment, and by June 2000, 33 municipalities had attributed \$1.8 billion in private investment and more than 8,000 new jobs to brownfield redevelopment.

Urban core areas also frequently contain many properties that the owners simply have abandoned, but they cannot be cleaned up, sold, or reused until the cities can obtain clear title to them. Until the last few years, tax reversion, the process by which such property reverts to public ownership, was lengthy and cumbersome, which stymied local redevelopment because

of long delays in giving new investors clear title to abandoned properties. Public Act 134 of 1999 streamlined tax reversion, making it easier for local units of government to claim abandoned properties and encourage private investors to redevelop them. As of May 2001, 4,000 Michigan properties had been reused. In addition, Public Act 258 of 2003 created the State of Michigan Land Bank Fast Track Authority to help return blighted tax reverted properties to productive and economically viable use. The Authority works to return parcels to community tax rolls, initiates innovative revitalization programs with non-profit and other organizations, and collaborates on projects with county and municipal governments. PA 258 also enabled the creation of county and local land bank fast track authorities, several of which have been created in the state's urban areas.

Chapter 4. Transportation / Land Use Planning Integration: Issues and Considerations

The relationships between land use and transportation are complex and synergistic. This chapter discusses the issues and implications of Michigan's demographic, socioeconomic, employment, inter-governmental, and residential pattern changes to transportation and land use. The primary data sources for this Chapter were *MI Transportation Plan Socioeconomic Technical Report* and the US Census 2000. (The reader is reminded that the *Socioeconomic Technical Report* discusses transportation issues relative to demographic changes. This report focuses on Land Use issues and does not attempt to re-state the socioeconomic discussion.)

4.1 Demographic and Socioeconomic Shifts and Dynamics

From 1998 to 2005, Michigan grew in population by only 0.4 percent annually. The population is expected to continue this slow growth, an estimated 12 percent total between 2005 and 2030. Forecasts show that people age 65 and older will comprise over 20 percent of Michigan's population by 2030. Studies predict that seniors will remain in the labor force longer and retire in-place (in their own suburban homes) or relocate within Michigan.

Michigan lost over 570,000 people during the 1980s due to net out-migration. Much of this out-migration was workforce age population. This loss was offset by in-migration from international populations. It is expected that by 2030, the 25-65 age group will shrink from 55 to 47 percent of the population and the under 25 population will shrink from 35 to 32 percent.

Michigan continues to diversify culturally and ethnically. According to the US Census Bureau, Michigan's Caucasian population (all ethnicities), which was 82.3 percent in 1990, declined to 78.5 percent in 2005. In addition, international immigrant growth in Michigan has increased from approximately 100,000 in the 1980s to 171,000 in 2000, and is expected to grow to over 195,000 by 2020.

During the last 15 years, personal income in Michigan has kept pace with national trends. However, even with this being the case, the percentage of persons at or below the poverty level

has increased. For example, the US Census reports that the number of people living in poverty in Michigan grew from 9.7 percent in 1994 to 11.4 percent in 2003.

4.1.1 Aging Population

The most pronounced socioeconomic change in Michigan is expected to be the increase in aging and retired populations. While many seniors are expected to remain in their current homes (retire-in-place), it is also expected that retirement and adult living communities/developments will grow. Throughout the US, there appears to be a trend with urban areas being redeveloped with condominiums that are attracting empty-nesters. The American Association of Retired Persons (AARP) has conducted transportation studies showing that seniors and retirees still prefer to travel by private automobile and continue to drive the same number of miles, only at off-peak times. This may result in a re-densification of the urban core and establishment of more compact housing that, while auto dependent, may be more efficiently served by public transit and similar services.

4.1.2 Income Dynamics

While more Michigan residents and families are living in or below poverty, more are also living with increased wealth. In Michigan, as in many parts of the US, the size of the middle-class is shrinking. During the last century, increased wealth has often given families the option of moving further outside the city, thus contributing to suburban and exurban sprawl development patterns. This trend, in turn, has facilitated a deterioration of what are often called the “first-ring suburbs.”

4.1.3 Diversification of Immigration

The recent growth in immigration does not represent the Eastern European patterns of the early 1900s. Instead, Michigan, particularly in the Detroit area, has been most recently receiving immigrants from Asia, Middle East, and North America. These groups have a higher degree of socioeconomic diversity than did immigrants in the early and mid 20th Century. This diversity drives different settlement patterns. For example, Asians tend to immigrate mainly to Oakland County, but there are sizeable populations in Macomb, Wayne, and Washtenaw counties as well. The main influence on their settlement pattern is socioeconomic status. Asian groups with higher income and education (Asian Indian, Chinese, and Japanese) are found in suburban cities like Troy, Bloomfield Hills, and Farmington Hills. Groups with limited financial means (Hmong, Bangladeshi, and Pakistani) have a very different pattern. Because of their smaller numbers, limited financial means, and the housing market of southeastern Michigan, these groups primarily settle in older suburbs like Hamtramck and Warren or central cities like Detroit and Pontiac. Group size influences the settlement patterns of Middle Eastern immigrants as well. The largest groups immigrating to southeast Michigan include persons

from Iraq, Lebanon and Yemen. For the most part, many of these immigrants settle in Dearborn, which has the largest concentration of Arab immigrants in the United States.²

4.1.4 Growth in Number of Households / Smaller Household Size

Household growth has been 1.5 times faster than population growth. From 2005 to 2030, the number of households is expected to grow by 19 percent. This trend has continued from the 1970s when the household size was 3.3 persons to today's average household of 2.6 people. This growth is outpacing population growth because of the increasing number of single-person households, smaller family sizes, and more elderly or seniors living alone. The land use implication of this is more a growth in the absolute number of housing units than a change in pattern.

4.2 Economic and Employment Changes

Significant changes have occurred in Michigan's employment over recent decades. In 1970, manufacturing was the dominant sector with 30 percent of the jobs. Today, it represents less than 20 percent of Michigan's jobs and is expected to decline to less than 15 percent by 2030. Between 2000 and 2005, Michigan lost 218,000 manufacturing jobs. Detroit alone lost 100,000 manufacturing jobs in the last five years. Employment gains in high-wage advanced service industries were not large enough to offset the loss of manufacturing jobs.

4.2.1 Manufacturing

During the last decade, employment growth has been slow and projected to remain slow. High-paying manufacturing jobs have left the state only to be replaced by service jobs. Most jobs are in the southern portion of the Lower Peninsula, primarily in Flint, Saginaw, Detroit, Grand Rapids, Lansing, Ann Arbor, and Kalamazoo Metro areas. In terms of land use implications, many jobs have shifted to outside the urban areas to the suburban ring communities. It is anticipated that as the labor force shifts and ages, employers will relocate to localized labor pools, further extending sprawling development patterns and continuing to decrease job opportunities in the urban core where people could reach their jobs via public transit. The decrease in manufacturing may also mean fewer trucks and trains that are Michigan-originated or -destined, and more that are passing through. Through traffic tends to be concentrated on the southern portion of the Lower Peninsula, primarily in Flint, Saginaw, Detroit, Grand Rapids, Lansing, Ann Arbor, and Kalamazoo Metro areas. Increases in through traffic will place capacity demands on corridors serving these urban areas.

²Booza, J., "Recent Immigration Trends in Southeast Michigan," *Profitwise News and Views*, June 2004, Federal Reserve Bank of Chicago, www.chicagofed.org/community_development/06_2004_pnv_recent_immigration_trends_in_michigan.cf m.

4.2.2 Agriculture and Extractive Industries

Farming, mining, forest and fishing employment declined or were flat between 1980 and 2005, with most employment growth during that period occurring in retail, construction, services, government, and wholesale. This trend is expected to continue to 2030. The land use and transportation impact of this includes people moving away from rural areas to be closer to jobs in suburban service areas and the fact that service jobs require more travel for people to serve each other. This may result in more automobile-dependent travel.

4.2.3 Tourism

One of the biggest growth industries in Michigan is tourism. These jobs are both in the rural parts of the state including the Upper Peninsula and in the casinos and urban areas. Among the positive aspects of tourist industry growth is that maintaining aesthetics and the quality of the environment is important to maintaining the industry. Land use patterns will most likely be designed to create a positive visual environment. One potentially negative transportation issue is that tourists may prefer to travel at a relatively slow pace to enjoy the scenery, while local residents and freight haulers are usually seeking to travel quickly. The speed differential may create transportation safety problems on roadways in tourist areas.

4.3 Inter-governmental Relations

Transportation issues are demanding an increasingly prominent place on local agendas. Whether it is on potholes or laying out roadways in a subdivision, local officials are spending more time making sure people and goods can move safely and efficiently. Pressure is growing and funds are limited.

4.3.1 Relationship of Home Rule and Local Planning Authority

Michigan is a home rule state, with more than 1,800 units of local government (counties, cities, villages and townships) having legal authority to engage in land use planning and/or zoning. To date, over 1,400 units of government have secured this authority. At the same time, MDOT has over 9,700 miles of state highways, with these passing through all but 259 units of government. While local land use decisions often affect the Michigan transportation system, MDOT has no role in land use decision-making and often reacting to land use policies and plan implemented at the local level.

The body of state statutes known commonly as the “planning and zoning enabling laws” sets the rules for local land development decisions in Michigan. These statutes, which date to 1921 in the case of cities and villages and 1945 for townships and counties, have changed little over the years. They enable, but do not require, local governments to plan and zone. They allow local units of government to (1) plan when, where, and how development of land should occur and (2) set standards in such matters as how buildings shall be designed and how specific areas (zones) shall be used (commercial, residential, and so on).

Land use planning may occur within cities, villages, townships, and/or counties, but the state provides little guidance or demand for uniformity. Furthermore, there is little coordination between units of government. Only 24 of the 83 counties have countywide zoning ordinances. Conflicts often arise between neighboring jurisdictions. In addition, certain public buildings (e.g., corrections, foster care, and education facilities), do not necessarily need to fully comply with local zoning regulations.

4.3.2 Interagency Coordination

Although MDOT uses land use inputs from MPOs in travel demand modeling and works with the 14 Planning Regions to collect data and communicate in rural areas of the state, there remain hundreds of non-municipal, public entities that make land use decisions not bound by local planning and zoning. These include school districts (597), intermediate school districts (59), community colleges (29), state universities (13), tribal governments (11), and uncounted federal, state, and local agencies and authorities. In addition, the 2002 amendments to Michigan's planning statutes encourage neighboring governmental units to cooperate with one another during land use planning processes, but few of these other entities are included. A decision by local governments or special districts to extend sewer and water lines continues to spread development into new areas. A decision to locate new schools in the rural areas reduces the ability or probability for students to walk or bicycle safely to school. Each of these land use decisions results in a demand for new or improved roadways or highways. In this and other ways, Michigan is behind many states in addressing land use challenges. More than a dozen states have passed comprehensive growth management laws, and many more have adopted significant smart-growth initiatives.

4.4 Residential Location Patterns

From 1980 to 2005 the northern Lower Peninsula, the Grand Rapids area, and portions of southeastern Michigan have grown up to 50 percent over the 25-year period. For 2005 to 2030, the Grand Rapids area, the northwestern portion of the Lower Peninsula, Keweenaw County in the Upper Peninsula, and the suburban counties (especially Livingston) in southeastern Michigan are expected to grow at 25 percent or higher. All other areas of the state will have 25-year combined growth rate of less than 25 percent.

According to the *Final Report from the Michigan Land Use Leadership Council*, Chapter 2, from 1990 to 2000, population in 13 representative Michigan cities fell by 4.3 percent. All 13 cities experienced out-migration.

4.4.1 Location Choices

4.4.1.1 Rural / Small Town Preferences

According to land use reports prepared for the Michigan Leadership Council, Michigan residents prefer living in rural areas and small towns, a choice resulting in urban sprawl and increased dependence on the personal automobile. Increasingly, the land use dialogue has

turned to an examination of the causal role public policy plays in shaping land use decisions and patterns. The current preference of Michigan citizens for new homes on large country lots is an expression of personal choice, but choice depends on available options and cost. To some extent, these choices are driven by public policy at all levels of government (federal, state, and local). Examples of these public policies include:

- Zoning land for single-family use at one unit per acre or greater and land divisions in 10-acre parcels results in very low-density scattered land use patterns that, over time, contribute to a reduction in the economic viability of farms and forests.
- The process for clearing a title in urban areas is so cumbersome and lengthy that it discourages redevelopment and land assembly efforts in urban areas.
- Government spending patterns can encourage the use of greenfields over brownfields.

4.4.1.2 Retirement

It is anticipated that as the senior population in Michigan grows, additional senior or adult communities or assisted living centers will be developed. This type of development will most likely be more compact and could be designed to be transit-friendly or self-contained and include grocery, banking, and similar service facilities. These developments could be designed to provide residents mobility through walking trails or accommodate small electric vehicles such as golf carts within them.

4.4.1.3 Vacation or Second Home

According to the US Census, Michigan gained over 57,000 vacation or second homes between 1970 and 2000 (from 178,000 to over 235,000), growth that complements the rise in tourism. However, the transportation impacts may mean more people driving their personal vehicles longer distances to commute to their second homes on the weekends.

4.4.2 Residence/Place of Employment Dynamics

As stated earlier, the relationship between workplace and residence and transportation is best described as synergistic and spiraling.

4.4.2.1 Change in Work Location

Beginning in the late 1960s and continuing today, as skilled workers and their families moved out of the center cities to the suburbs, they were followed by the companies that employed them. As urban beltlines began to emerge, service, research, technology businesses, warehousing, and light manufacturing seeking expansion space, also moved outside the urban core to sites that were easy to access by automobile and trucks.

4.4.2.2 Change in Vocation

As stated earlier in this report, Michigan's economy has transitioned over the years. It had its origins in mining and forestry and agricultural products, and then was one of the major

manufacturing centers of the world; most recently, it is moving to a service-based economy with jobs focusing on tourism, retail trade, technology, and health care. As discussed in **Chapter 2, Historic Land Use Development Patterns**, each of these three demand different land use patterns and are based on different modes. With changes in the types of jobs available, people were required to change vocations, leave Michigan, and/or move to be close to a job in order to remain employed. Remaining employed may also have required changing the mode of transportation used to access the available jobs.

4.4.2.3 Employee Preference

Many service businesses were attracted to the suburbs, following employees' residential preference of the suburbs. Restaurants, dry cleaners, grocery stores and shopping malls also moved out to be near people's homes. Many service businesses developed along highways or in suburban clusters that are only accessible by a private automobile. This land use development pattern further reinforced the need for infrastructure to support the private automobile.

4.4.2.4 Travel Characteristics

Despite efforts to encourage carpooling and transit use, more Michigan residents in 2000 drove to work alone than did in 1990 (from 81.5 percent to 83 percent.) Similarly, fewer people used alternative modes such as a bus, bicycle, or walking (5.5 percent in 1990 vs. 4.2 percent in 2000).

In line with the rest of the nation, it is taking longer for Michigan residents to get from home to work. In 1990, 71 percent of the population took less than 30 minutes to get to work. However, the 2000 US census showed that only 67 percent could travel to work in less than 30 minutes.

4.5 Activity Centers

The *Corridors and International Borders Report* prepared as supporting documentation to *MI Transportation Plan* identified Michigan Activity Centers. Activity centers play a key role in Michigan's economy; they are locations with concentrations of jobs, transportation infrastructure, and service facilities. As Michigan's economy shifted from rural to urban and suburban, and from agriculture to manufacturing to a primarily service-based economy, these activity centers have become the current center for economic activity and the potential growth areas for the state.

4.5.1 Definitions

Activity Centers are defined as Geographic locations with concentrations of people, jobs, educational and health service facilities, tourist attractions, or other similar economic-based facilities or services. International border crossings are included within some activity centers.

MDOT identified activity centers based on quantitative criteria and an analytical process as explained in the *Corridors and International Borders Report*. Details on criteria and thresholds used to identify activity centers are referenced in **Table 2** below.

Table 2: Criteria and Thresholds Used To Identify Activity Centers

<i>Activity Center Criteria</i>	<i>Measure</i>	<i>Threshold</i>	<i>Data Source and Year</i>
Urban			
Urban Areas/Urban Clusters in Michigan	Population	Greater than 5,000 Persons	US Census Urbanized Area/Cluster 2005
Nearest Urban Center outside Michigan	Population	Greater than 200,000 Persons (Transportation Management Area (TMA))	US Census Urbanized Area/Cluster 2005
Commercial			
General Economic Activity	Total Employment	Greater than 2,500 Employees	MDOT TAZ
Retail Activity	Retail Employment	Greater than 1,000 Employees	MDOT TAZ
Tourism			
Hotel Capacity	Hotel Units	100 or More Units	MDOT
Annual Lodging Use Tax revenue	Tour Tax	Annual Tax Value \$50,000 or more	MDOT
Gaming	Gaming Centers	Major Gaming Centers were identified as a characteristic of an Activity Center	MDOT 2005
State Park	State Park Location	None	MDOT
Number of Visitors	Person Trips	Annual Personal Trip Total Greater or Equal 1,000,000	MSU Tourism Data 2004
Length of Stay	Person Days	Annual Personal Trip Total Greater or Equal 3,000,000	MSU Tourism Data 2004
Education/Technology Center			
Postsecondary Education Centers	Type of Postsecondary	Community Collages and Universities	US Department of Education/Michigan Department of Education 2005
Smart Zones	Technology Centers	All Smart Zones	MDOT 2006
Life Sciences Facilities			
Hospital	Local Employment	Greater than 500 Employees	MDOT 2005

Correctional Facilities

Prisons	Prison Facility Locations	Major Correctional Facilities were identified as a Characteristic of an Activity Center	MDOT 2005
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Passenger Facilities

Air Passenger	Passenger Enplanement	All Airports with Passenger Enplanement	MDOT TMS 2005
Amtrak	Passenger Station	All Active Passenger Stations	MDOT TMS 2005
Intercity Bus Station	Passenger Stations	All Active Intercity Passenger Bus Stations	MDOT TMS 2005
Car Pool	Parking Capacity	Greater Than 100 Parking Spaces	MDOT TMS 2005

Freight Facilities

Air Cargo Ports	Cargo Deplanement	All Air Ports with Cargo Deplanement	MDOT TMS 2005
Marine Ports	Cargo Tonnage	All Cargo Ports Receiving or Shipping Tons of Goods	MDOT TMS 2005

International Border Crossing

Passenger and Freight	Passenger and Freight	All International Border Crossing with Passenger and Freight Activities	MDOT 2005
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4.5.2 Impact on Transportation and Land Use Patterns

Many of Michigan's activity centers provide a unique service or support specialized industry. Some are tourist hubs, technology centers, and health care facility centers, while others are university-focused. People and goods move between these centers to take advantage of their unique services. For example, an activity center may provide specialized medical facilities, or educational institutions. Multi-modal transportation corridors connect Michigan's people and goods between activity centers. Major urban activity centers that may offer several types of services and support a variety of employment may also be served by several modes of transportation. As has been discussed earlier in this report, the greater the concentration or density of people and jobs, the greater the potential for more transportation modes to be available and efficient.

4.6 Michigan Land Use and Leadership Council

In 2003, the bipartisan Michigan Land Use Leadership Council, convened by Governor Granholm with the support of the leaders of the MI Senate and House, determined that it was important to articulate a vision and land use goals for Michigan and to recognize the legal

framework and the key assumptions underlying its adopted vision and goals. The council established three fundamental goals:

- Economic prosperity;
- Stewardship of the environment, cultural, and natural resources; and
- Equitable distribution of benefits to all residents.

It emphasized that these three goals are interdependent and require government leadership in guiding public and private land use decisions and policies that reflect the importance of balancing the goals in achieving sustainability. The council's August 15, 2003 report lists 10 smart growth tenets used to develop many of its recommendations. The council highlighted and discussed two major components of the state's legal framework (1) private property rights and (2) the concept of home rule and acknowledged their importance in its deliberations. The council's report also lists key assumptions and constraints, including the budgetary implications of its recommendations.

4.6.1 Land Use Council Recommendations

Based upon background materials, the survey results, and public comment, the council organized issues into four broad categories within which it developed guiding principles and recommended actions to address specific issues. These four categories are reflected in the chapters of the final report and include:

- Urban Revitalization;
- Land Resource-Based Industries;
- Planning and Development Regulation; and
- Infrastructure and Community Services.

The council avoided radical recommendations and divisive issues. Neither recommendations nor regulations were advanced to support state or regional land use planning, impact fees for growth area, or mention of educational equity, youth development, or school choice. The council also recognized and concluded that land use actions remain market driven and when the economy is in trouble, local officials are willing to sacrifice good land use practices for some improvement in the tax base or to create some jobs. Despite these collaborative efforts and the spirit of compromise exhibited by the council throughout its deliberations, a few contentious issues could not be resolved to everyone's satisfaction. Following the last meeting, each council member was given the opportunity to reserve his or her support or object to specific recommendations adopted by a majority of the council. Reservations or objections of individual council members on specific recommendations are noted following each recommendation.

A summary or paraphrasing of the specific recommendations could undermine the carefully constructed language crafted and adopted by the council and contained in the final report. In general terms, the council's recommendations address broad thematic areas that focus on ways in which government policies and decisions, in cooperation with the private sector, can provide

leadership on and a balanced approach to issues of common concern. Consistent with the council's stated vision and goals, the recommendations focus on incentives and assistance rather than mandates to encourage private sector cooperation in addressing identified concerns. Similarly, the recommendations of the council provide new tools, alternative planning approaches, technical assistance, and resources for local government to reduce sprawl and encourage inter-governmental and interagency cooperation in planning for infrastructure and services that serve large geographic areas.

Chapter 5. Land Use and Transportation Practices from Other States

In recent years, Michigan has developed and applied a variety of tools and strategies for more effectively integrating land use and transportation planning, including an Access Management Handbook, a Transportation Economic Development Program, Context Sensitive Solutions, environmental mapping and Bicycle and Pedestrian Programs. This chapter presents a summary of some of the notable programs and approaches used across the nation that are potentially transferable to Michigan as it seeks to expand and strengthen its in-state efforts. This summary is derived from an FHWA-prepared listing and description of 30 tools, methods, strategies, and procedures along with implementation examples, that state DOTs and MPOs use to integrate transportation planning and land use. **Appendix A** presents a complete listing of the tools and examples from the FHWA Web site (<http://www.fhwa.dot.gov/planning/landuse/tools.cfm>). Case studies and other references and links are also available on this site at <http://www.fhwa.dot.gov/planning/landuse/index.htm>.

5.1 Examples

FHWA categorized five types of programs, methods, or strategies that state DOTs and MPOs use to integrate transportation and land use. These categories include planning activities, public involvement, GIS and technical analysis, project prioritization and funding, and design guidelines and standards. One of the most comprehensive examples and approaches using the five types of programs to address the integration of land use principles with transportation and economic development is the New York State "Quality Communities Clearinghouse" program. Almost every type of state-sponsored program or service is incorporated or addressed by this program. Details on the New York State program may be found at <http://www.qualitycommunities.org/index.sap>.

5.1.1 Planning Activities

This program category includes considering land use issues while conducting transportation planning for corridors, interchanges, and statewide or MPO comprehensive plans. It includes education and outreach on principles and concepts such as transit-oriented design, overlay districts, or other zoning changes that may facilitate increased transit efficiencies. While MDOT

has developed a variety of planning tools, guidelines and programs that mirror many of these, it can be valuable to consider what other states and jurisdictions have done as MDOT's efforts evolve and grow.

Some notable examples include:

- Guidebooks and model zoning ordinances: Idaho DOT and Wisconsin DOT have published transportation planning guidebooks aimed at helping local staff integrate transportation planning with land use planning. Vermont Agency of Transportation, working with the Vermont Department of Housing and Community Affairs, jointly developed modal zoning guidelines to help local governments incorporate access management principles into their zoning and to help direct development away from interchanges. The Burlington, Vermont MPO, Florida DOT, and Maryland DOT developed guidelines to help planners and developers with transit-oriented design concepts.
- Grants and funding: Illinois DOT provided \$15 million over five years to help local governments develop plans that integrate transportation and land use. Colorado DOT together with and through their state Heritage Planning Grant Awards program collaborates with local governments on transportation planning.
- Environmental: Florida and Ohio DOTs instituted processes to identify environmental and land use concerns early in the project development process. Colorado and Washington state DOTs use their EIS process to identify and incorporate environmental issues and land use concerns into project development.

5.1.2 Public Involvement

This program category includes developing community outreach tools to raise the level of awareness about the connection between land use and transportation. It includes sponsoring or participating in visioning workshops and charrettes (collaborative sessions in which urban planners/designers consult with stakeholders, developers, municipal officials, and local residents to come up with joint solutions to urban planning issues) that develop future land use scenarios, which include the design of transportation- and transit-oriented facilities. Most notable examples are MPO-sponsored or initiated events in which the state DOTs participate.

5.1.3 GIS and Technical Analysis

This program category includes using one of several GIS-based software packages and models to create and explore various land use scenarios that also address transportation facilities. It also includes GIS mapping of transportation, environmental, historical, land use, and other features that can be accessed and used during the transportation and land use planning processes. Notable examples include:

- Software Programs: CommunityViz, MetroQuest, Paint the Town/Paint the Region, PLACE³S, Smart Growth Index. Idaho DOT used MetroQuest in a scenario-based

planning process to create a statewide transportation vision. Over 750 transportation partners participated in the two-year process.

- GIS and Environmental Mapping: State DOTs throughout the US have worked with other state agencies to produce GIS base maps of transportation and other relevant environmental and land use features. These resources are used by state DOTs in the project development and planning processes and by local governments during comprehensive land use planning.

5.1.4 Project Prioritization and Funding

This program category includes state DOTs and other agencies providing incentives to jurisdictions who adopt policies and implement projects that incorporate or support desired transportation development principles. Some policies and principles include concepts such as enhancing walkability, pedestrian friendliness, and transit-oriented site design. This category also includes adopting project selection criteria that consider regional or local land use plans or smart growth criteria. It includes funding for local transportation capital improvements such as pedestrian facilities. It includes state DOTs providing technical assistance and outreach to promote good transportation and land use integration. Notable examples include:

- Financial Assistance: Massachusetts Executive Office of Transportation provides financial assistance to public agencies for pedestrian and bicycle facilities, as well as housing and parking projects in mixed-use developments located near transit stations.
- Priority Funding / Project Section Criteria: Maryland state agencies, including the department of transportation, established priority funding areas to focus economic development and state projects to specific areas of the state. The Denver and Seattle MPOs provide priority points to projects that support specific criteria or are located in specific areas such as infill and mixed-use development, projects that support access management.
- Fiscal or Regulatory Incentives: New Jersey DOT, Oregon DOT, and Utah DOT give priority to projects by expediting permits and streamlining regulation for communities that support various land use and transportation planning programs or policies. Some favored priority programs and policies include using context-sensitive design, adopting balanced street design, growth management, and access management measures. Utah DOT works with other state agencies to provide certification to communities that participate in this program.

5.1.5 Design Guidelines and Standards

This program category includes DOTs developing, publishing, and sometimes providing training on transportation and land use design standards and guidelines. Common guidelines include: Context-Sensitive Design and Context-Sensitive Solutions (CSD/CSS); roadway design guidelines; bicycle and pedestrian facility design standards; model zoning ordinances; transit-oriented design guidance; access management guidelines. This category also includes programs to address situations when a state highway serves as a downtown main street. State

DOTs have worked out programs to transfer these roadways to others that may better meet the state design standards. This will allow downtowns to achieve development goals and the DOT to achieve design standards for the roadway. Some examples include:

- CDS/CSS: California, Minnesota, New Jersey, New York State, and Vermont transportation agencies have all published Context-Sensitive Solutions policies or programs and most provide workshops and training in CDS/CSS.
- Bicycle and Pedestrian: FHWA, National Highway Institute (NHI), Florida DOT, and Washington DOT all have published bicycle and pedestrian standards, design manuals, and training.

5.2 Lessons Learned / Potential Transferability to Michigan

Comments and concerns from participants in *MI Transportation Plan* public meetings, and the findings, conclusions, and recommendations from Governor Granholm's Michigan Land Use Leadership Council demonstrate that there is both a strong interest and desire to better integrate transportation and land use. MDOT has already begun to implement processes and tools to achieve better transportation-land use coordination. The list below highlights some of the tools MDOT is employing as well as others it might enhance to better understand the relationships and improve their integration:

- Coordination with other state agencies and local public agencies including the MPOs: MDOT works very closely with the 15 Michigan MPOs in the development of their annual unified work program, development of their transportation model, long-range plan and Transportation Improvement Program (TIP). MDOT also funds the 14 State Planning & Development Regions to collect transportation data and serve as coordinators for various transportation efforts.
- Promote Education: Having knowledgeable decision-makers at the local level goes a long way toward implementing positive land use decisions. However, there are barriers to educating local elected and appointed planning officials, including access to, availability of and the cost of training. Efforts such as Michigan State University's Citizen Planner Program and the Michigan Association of Planning's Training for Officials, both of which provide planning and zoning training to local officials, are valuable endeavors.
- Outreach: MDOT's Regional Planning staff could expand efforts to work with local agencies during their visioning and planning processes.
- Sharing Data: Like many DOTs, MDOT can continue to enhance and share its GIS-based data with local land use agencies and MDOT environmental programming staff. This would facilitate identifying and incorporating transportation and land use issues during planning and project development processes.

- Process Enhancements: MDOT could revisit its project development and planning processes to better identify and incorporate land use issues and concerns early in the planning and National Environmental Policy Act (NEPA) processes.
- Guidance Documents: MDOT has guidance documents for access management and context sensitive solutions, transportation enhancement and transportation economic development. MDOT uses AASHTO documents for non-motorized and pedestrian

Chapter 6. Findings and Conclusions

As has been stated throughout this report, transportation and land use have a complex and synergistic relationship. Changes in transportation technology and availability provide opportunities, as well as positive and negative changes to land use patterns. Changes in land use patterns result in changing demands for transportation facilities and services. With the rising costs for transportation infrastructure, limited funding for system expansion and lack of formal or regulatory coordination between those who make land use decisions and those who make transportation decisions, the problems and issues with each is intensifying.

In addition to the need for coordination, evaluation of transportation problems requires focusing on land use and access in addition to mobility and safety. By physically moving people and services closer together, more transportation modal options could be feasible. In-fill housing, live-where-you-work programs, brownfield redevelopment and developing shopping, schools, and other service-oriented facilities within walking and bicycling distance can all reduce transportation demand; particularly demand for single-occupant vehicular travel.

The examples presented in **Chapter 5, Land Use and Transportation Practices from Other States** provide other information and ideas that MDOT may want to consider. By developing land use educational programs and incentives and offering free technical advice to local land use decision-makers transportation costs may be reduced. One potential program to address these issues may be to work with local governments and the County Road Commissions on a statewide initiative for TSM/TDM (transportation system management, transportation demand management). As discussed in the *MI Transportation Plan Corridors and International Borders Report*, this initiative would include education, incentives, and assistance for local governments to adopt TDM/TSM programs.

6.1 Coordination

The issue of lack of interagency and inter-governmental coordination in relation to land use has been recognized for years. Several initiatives, including Governor Granholm's Land Use Leadership Council, which began in 2002, have cited and evaluated the need for greater cooperation and coordinated land use decision-making. A decade earlier in 1992, the state conducted the Michigan Relative Risk Analysis Project, asking state scientists, policy-makers, and business and environmental leaders to identify and rank the risk of environmental problems in the state. The absence of coordinated land use planning and the degradation of

urban environments were cited as among the states top six most pressing environmental issues. In addition, such studies as the Fiscal Impact of Alternative Land Development Patterns in Michigan (Southeast Michigan Council of Governments, 1997) show that the costs of public services and infrastructure in low-density development (single homes on large land parcels) areas outstrip the tax revenue that such development generates.

6.1.1 Interagency (horizontal)

As discussed, home rule is often cited as one of the reasons for the lack of land use coordination. More than 1,800 units of local government have legal authority to engage in land use planning and/or zoning in Michigan. Land use planning occurs within cities, villages, townships, and/or counties. The federal law that applies within MPO areas requires coordination among local agencies on transportation planning. Outside of these areas, there is little planning coordination between parallel units of government. While the 2002 amendments to Michigan's planning statutes encourage neighboring governmental units to communicate with one another during land use planning processes, this coordination is essentially voluntary as there is no coordinated planning requirement in Michigan's planning laws. This lack of horizontal coordination across jurisdictions or between various state agencies encourages a checkerboard pattern of development across the state.

6.1.2 Inter-governmental (horizontal and vertical)

There is also a lack of vertical coordination between local, state, and federal governmental entities. In addition to local governments, hundreds of other public entities make land use decisions that are not bound by local planning and zoning, including school districts (597), intermediate school districts (59), community colleges (29), state universities (13), tribal governments (11), and uncounted federal, state, and local agencies and authorities. The 2002 amendment to Michigan's planning statutes does not facilitate or encourage coordination with these other entities. Many of the issues and inconsistencies between state and local government land use planning and transportation can be attributed to one factor: the lack of integrated and coordinated land use decisions. Some of the more specific general implications of land use decision-making in Michigan consist of the following:

- Too many decision bodies. There are thousands of independent entities involved in land use decision-making in Michigan, all with different planning and zoning approaches and procedures. This current structure makes achieving inter-governmental coordination difficult.
- Some laws require planning but no coordination. Plans or studies are often required before regulations can be made or projects can be implemented, but rarely are these plans and studies required to be coordinated with the community master plan prepared by the local planning commission.
- Laws are many and outdated. The age and number of laws involved in the present land use decision-making framework are viewed as an impediment to improving the quality and coordination of local land use decisions. Not only is the sheer volume of laws

daunting, but the laws also lack contemporary planning and development tools that are available in other parts of the country.

- Lack of common structure to existing laws. The current statutory structure evolved incrementally and, therefore, lacks focus and a common structural form. The result is a series of uncoordinated, independent laws with no clearly stated goal or set of common principles upon which the laws are based.
- Structure sometimes works at cross-purposes. The basic structural elements of the current land use decision-making process sometimes work at cross-purposes, that is, they are in disagreement with each other. For example, home rule/local control emphasizes independence not interdependence. Local officials are not concerned about satisfying constituencies outside their voting districts and, therefore, do not take actions in support of broader public interests.
- **Gaps in roles and responsibilities.** There are obvious gaps in the roles and responsibilities of the key players involved in land use decision-making:
 - There is no statewide land use agenda that would enable regional governments or planning and development regions to exercise authority over local governments to ensure more coordinated planning.
 - There is no apparent quality control process to determine the validity of required studies, plans, or regulations before and after implementation;
 - Studies and plans are not required to be current and there is no process to ensure conventionality even if an enforcement provision was in place;
 - There is no systematic obligation for intergovernmental cooperation;
 - There is no periodic or systematic evaluation of the overall effectiveness of local planning, economic development, or environmental protection;
 - Accountability for the effects of land use decisions on abutting jurisdictions is weak, especially on issues of greater-than-local concern;
 - Many land uses with significant impacts are not addressed in current legislation; and
 - There is no mandatory training for elected decision-makers, for many special commissions or boards, or for planning commission or zoning administrators.

It is easy to conclude that the current structure with no common model, too many decision bodies, and virtually no requirements for coordination could not possibly work. In this context, it is intriguing that land use decisions are made as well as they are, as often as they are. It is clear that local land use decisions are dependent on an understanding of the intricacies of and inter-relationships within the current structure. The fact that the current system operates at all

can be credited to local decision-makers and developers who invest a great deal of effort into coordinating decisions between communities and agencies at all levels of government.

6.2 Stakeholders

Michigan transportation and land use stakeholders and decision-makers are often the same individuals or agencies. The transportation/land use coordination challenge is that the individuals and agencies have different responsibilities and levels of authority over transportation and land use decisions.

6.2.1 Transportation

Transportation stakeholders include the DOT, FHWA, Federal Transit Administration (FTA), MPOs, regional councils, transit agencies, rail and air service providers, freight haulers and shippers, businesses, industries, local governments, environmental justice populations, and all other transportation system users. Through this and other reports the role and responsibilities of each of these groups has been discussed. While some state and federal guidance and recommendations for coordination exist, nothing is required. This voluntary system of coordination has had limited success in providing coordination between transportation and land use decision-making.

Michigan's MPOs and regional councils are agencies and transportation stakeholders whose role and purpose is to encourage transportation and land use stakeholders to cooperate. A regional council is a public organization encompassing a multi-jurisdictional regional community. It is founded on, sustained by, and directly tied to local governments through local and/or state government laws, agreements, or other actions. Through communication, planning, policy-making, coordination, advocacy, and technical assistance, the regional council serves the local governments and citizens in the region by dealing with issues and needs, which cross city, town, county, and, in some instances, state boundaries. Regional councils serve a region or sub-state district, which consists of a group of neighboring local communities whose residents are joined as a unit economically, socially, and geographically.

Regional councils have grown into pro-active, multi-functional, full-service regional organizations, prepared to enable regional communities and their leaders and citizens, to compete globally and thrive locally. They can:

- Provide regional forums bringing community leaders and citizens together to address common needs that span jurisdictional boundaries;
- Provide skilled, experienced staff to conduct regional strategic planning processes, develop practical strategies for addressing tough common challenges, and guide them into implementation;
- Provide technical assistance, information, and administrative services that expand the capabilities of individual local governments and groups; and

- Administer federal, state, and local programs that can be more economically and effectively delivered at the regional level.

Just as regional councils bring local governments together to meet regional needs, they also join with each other at the state and national levels to address the tough issues they have in common: land use, balanced growth, quality of life, environmental safety, aging infrastructure, and economic challenges. Michigan's 14 regional councils include:

- The Western Michigan Shoreline Regional Development Commission (WMSRDC);
- The Northwest Michigan Council of Governments (NWMCOG);
- The Southwest Michigan Commission (SWMC);
- The Northeast Michigan Council of Governments (NEMCOG);
- The Southeast Michigan Council of Governments (SEMCOG);
- The East Central Michigan Planning and Development Regional Commission (ECMPDRC);
- The West Michigan Regional Planning Commission (WMRPC);
- The Region 2 Planning Commission (R2PC);
- The Eastern Upper Peninsula Regional Planning and Development Commission (EUPRPDC);
- The Grand Valley Metropolitan Council (GVMC);
- The Central Upper Peninsula Planning and Development Regional Commission (CUPPAD);
- The Western Upper Peninsula Planning and Development Region (WUPPDR);
- The South Central Regional Planning Council (SCRPC); and
- The Tri-County Regional Planning Commission (TCRPC).

Developing a cooperative land use planning framework that encourages considering the regional consequences of local decisions is an essential aspect of a regional cooperation agenda. When coupled with a regional approach to providing services, local governments are finding real savings and making more efficient use of public investments. Combined or shared services, leveraged purchasing power, and joint equipment and facilities agreements can free capital for other financial needs.

6.2.2 Land Use

Stakeholders for land use are the same individuals and agencies as transportation stakeholders. In Michigan, as discussed, land use decision-makers are primarily local governments. For coordinated land use / transportation goals and decision-making to be a reality, local governments must play a significant role. Leadership for this can feasibly come from MDOT working through and with the MPOs and regional councils, as well as the Michigan Association

of Regions, the County Road Association, the Michigan Association of Counties, the Michigan Municipal League and the Michigan Townships Association. A successful program would focus on educating and having the buy-in, support, and cooperation of the 1,800 Michigan local governments. As discussed, coordinated land use/transportation programs would need education, incentives, and implementation components in addition to strong leadership.

6.3 Transportation Implications

Current trends and changes in land use patterns are affecting the economic feasibility of providing alternative transportation modal services as well as the access, structural conditions, and mobility of transportation facilities. For example: unless businesses are located along rail lines, it is unlikely that they will use rail transportation; if homes and jobs are not located in a dense enough development pattern, it is unlikely that they can economically be served by transit or by walking; if land use development grows rapidly, congestion will grow quickly. It is possible to build 2,000 homes within a couple of years but it may take 10 to 15 years to build a highway to serve the new growth generated by the 2,000 homes.

6.3.1 Highway Use

As use of the automobile and truck increasingly become the mode of choice, people, businesses, and industry are relocating in a sprawling land use pattern. This pattern continues to put pressure on Michigan's highways by increasing congestion and wear-and-tear on the roadways.

6.3.2 Transit / Intercity Bus/Rail Passenger

As Michigan's land development becomes less dense, the ability to be served by transit, intercity bus, or passenger rail becomes less economical. Most people today are willing to walk far less than a mile (and often only a quarter of a mile) to reach these types of transportation services. With homes and businesses spread out, unless there is a parking lot nearby, stations and stops can only be located in a limited number of convenient locations.

6.3.3 Rail / Commercial Truck

Use of commercial trucks became the prominent mode of transporting freight and commodities in part because of the changes in land use patterns, but more because of the changes in the way businesses began to operate in the 1980s. Businesses moved to save money by reducing or eliminating inventories and demanding "just-in-time" delivery of products and materials. Rail could not compete in guaranteeing on-time delivery and trucking companies, with the completion of the interstate system, could. Railroads reduced service and removed unprofitable lines. Commercial trucking replaced rail as the primary mode carrying the highest value of freight.

6.3.4 Air

Land use patterns and air transportation are not as closely linked as the other modes. Air freight is typically limited to high-value, low-weight, time-sensitive commodities that are

transferred to air cargo planes by truck. Major passenger airports are located throughout the state with the largest closest to urban populations. Passengers travel typically by automobile to airports; distance to the airport is not a major issue since the passenger air travel is typically limited to longer distance trips.

6.4 Options for Incorporating Policies and Investments that Support Integrated Planning into *MI Transportation Plan*

Many land use advocates have suggested that residential development policies and plans should at least consider clustered residential areas. This approach would provide outdoor open space and a density of housing that can be easily serviced by public transit. It would also begin eliminating the linear development that sometimes accompanies urban sprawl. Another option proposed in urban and metropolitan areas is mixed-use development, by which residential space exists above or adjacent to commercial development. This could mean that every shopping outlet, such as for food and/or pharmaceutical needs, could be housed in the same structure as dwellings. Such a configuration would eliminate the need to drive a vehicle to the grocery store, drug store, or bank, thereby reducing an individual's dependency on the automobile for access to essentials of life.

There are other land use development tools that have been proposed, but require legislative action and/or local initiative. Some of these are:

- Transfer of Development Rights;
- Development/Infrastructure Concurrency Requirements;
- General Service Districts or Urban Growth Boundaries;
- Official Maps;
- Intergovernmental Development Agreements;
- Inter-jurisdictional Growth Management; and
- Regional Impact Coordination.

Chapter 7. Integration Concepts

Particular segments of Michigan's transportation system users have special sensitivity to the land use-transportation relationship. Similarly, particular types of economic activities may be supported or hindered by the compatibility between transportation needs and land use patterns.

Integration of land use considerations in transportation planning decisions may remove performance barriers at the system level by locating users closer to activities and by making different mixes of transportation alternatives viable for users.

7.1 Travel Segments Sensitive to Land Use

Key segments with special sensitivity to land use planning in Michigan include:

7.1.1 City Residents

The *Travel Characteristics Technical Report* of the *MI Transportation Plan* finds the levels of walking and transit are highest among city residents. The density of land use and the co-location of residential, commercial and non-commercial places of business is a major factor enabling city residents to access activities by various modes with minimal travel time and cost. Michigan's cities are locations where land use decisions are most likely to involve choices that may create barriers, or remove opportunities for system users to access activities through transportation system components.

7.1.2 Transit Dependent People

The extent and frequency of transit service depends on ridership per revenue-mile. For this reason, transit services can efficiently support more trips, destinations and users in areas with greater density and with uses concentrated at locations that can be easily served by transit routes. For transit dependent people, land use decisions conducive to greater transit coverage and frequency translates into more accessible destinations, and greater access to the workforce and consumer markets.

7.1.3 Elderly Travelers

The *Socioeconomic Technical Report* of *MI Transportation Plan* indicates the growing cohort of Michigan's system users that are above the age of 65. **Section 4.1.1** of this *Land Use Technical Report* suggests that this may result in a re-densification of the urban core and establishment of more compact housing. Such patterns, even if populated by auto-dependent residents, may be efficiently served by public transit and pedestrian alternatives.

7.1.4 Children and Young People

The *Travel Characteristics Technical Report* of *MI Transportation Plan* indicates that children and young people make a large number of Michigan's pedestrian trips. For this reason, the density and walkability of communities is an important factor for the safety and scope of opportunities for children and young people to access activities in Michigan.

7.1.5 Low- Income Travelers

The *Travel Characteristics Report* of *MI Transportation Plan* shows that low-income households tend to have lower rates of automobile ownership, and depend more on ridesharing, transit and walking to access activities. For these reasons, the density and availability of lower income housing with pedestrian and transit access to work, markets and other activities is of special importance to this segment.

7.1.6 Ex-Urban and Regional Commuters

The growth in ex-urban communities, on the perimeters of Michigan's cities is often associated with a lower density of development. This often translates into longer roadway trips connecting users to activities, affecting vehicle miles of travel and duration of travel for ex-urban commuters. The proliferation of ex-urban, lower density land uses also makes transit and pedestrian alternatives less feasible, concentrating transportation needs on private automobile, roadway travel.

7.1.7 Freight Carriers (Including Mail and Contract Carriers) and Their Manufacturing/Service Industry Clients (Shippers)

The efficiency of freight system operations can be improved when supply chain partners are co-located within a manufacturing or industrial district. This reduces the likelihood of incident-induced delay, as well as the mileage of freight travel. Freight carriers are dependent on land use decisions as a determinant of the distance and routing of shipments. In a similar way, mail and contract carriers can achieve greater reliability and efficiency when major service establishments shipping large volumes of mail and contract traffic are concentrated in commercial districts, reducing the distance between destinations.

7.1.8 Immigrant and Non-English Speaking Populations

Section 4.1.3 of this *Land Use Technical Report* addresses the growth in Michigan's ethnic and cultural diversity. When ethnic communities are spatially concentrated in particular neighborhoods, cultural preferences regarding modes, travel patterns and values will require decisions about how to incorporate different system components in these areas.

7.1.9 Service Businesses

The *Socioeconomic Technical Report* of *MI Transportation Plan* indicates the growth of the service sector of Michigan's economy. In the service industry, location in proximity to the workforce as well as other service establishments that provide markets and inputs is a key success factor. Proximity to residential areas can also be an important factor for service establishments selling to final demand. The density and connectivity among service establishments and households can determine the degree to which the transportation system represents a barrier, or an economic opportunity for different types of service establishments.

7.1.10 Real Estate Developers and Private Land Interests

Real Estate Developers and Private Land Interests use the transportation system quality and availability as a key decision factor in the site selection process. Measures such as drive-time analysis, accessibility of principal arterials and intermodal facilities figure prominently in decisions regarding investments that may bring jobs, residents and other amenities to Michigan's communities.

7.1.11 Retail Vendors

Location relative to markets is known to be a key success factor in the retail industry. Accessibility of both workers and markets is made easier when retail uses are collocated relative to suppliers and final demand. Retailers (and some service providers) are sensitive in two ways: the traffic is necessary, yet at a certain volume, the movements created by traffic accessing an establishment can be a deterrent to patronage of that establishment, whether by automobile, bicycle or walking. When density supports pedestrian and transit access between retailers, retail workforce, retail suppliers and final demand, potential barriers to retail industry performance can be reduced, and opportunities for economic vitality can be created.

7.1.12 Tourist and Recreational Travelers

Section 4.2.3 of this *Land Use Technical Report* points out the growth of the tourism industry in Michigan. In areas with a strong economic base in tourism, the aesthetic quality of the environment makes land suitability for tourists sensitive to the transportation infrastructure. Tourists are a segment that may involve multiple modes and transportation system components because (1) cycling and walking are often common tourist activities (2) tourists unfamiliar with the host area may use transit as an easy way to access destinations and (3) tourists may arrive in the destination city by air, rail or intercity service. For this reason, land uses supporting the tourist industry require complex decisions about the availability and arrangement of transportation system components in a tourist area.

7.2 Performance Barriers and Opportunities

“Performance barriers” are conditions on the transportation system that make it more difficult, more expensive or impossible for an activity to take place. In the economic impact element of *MI Transportation Plan*, performance barriers are represented as costs of doing business; however, they also include barriers to households and individuals. In the *Conditions and Performance Technical Report* of *MI Transportation Plan*, performance barriers are described by performance measures. “Opportunities” are conditions on the transportation system that make it easier, less expensive or possible for an activity to take place that may not otherwise occur. In the economic impact element of *MI Transportation Plan*, opportunities are represented as amenities; however, they also include opportunities for households or individuals in addition to businesses. For the purposes of this report, opportunities are understood as special ways in which system performance may stimulate users to engage in more or better activities.

7.2.1 Performance Barriers

7.2.1.1 Limited Transit Schedules and Long Transfer Times

The feasibility of transit routes/schedules is directly related to the density of development along the route, and vice-versa. A greater density of transit-dependent households and activities will support more frequent transit services and more comprehensive route systems, which, in turn, support more development that caters to transit users. By contrast,

a lack of density or concentration of transit users and activities makes it difficult for transit to serve as a viable mode for many travelers.

7.2.1.2 Jurisdictional Boundaries

The problem of jurisdictional boundaries has been described throughout this report. Jurisdictional boundaries regarding land use decisions can result in uses and activities in one jurisdiction that are incompatible with transportation alternatives available in the jurisdiction providing the market for the activity. For example, one jurisdiction may support a high-density shopping development, which attracts shopping trips from surrounding jurisdictions. If the surrounding jurisdictions are unable to provide the roadway or transit capacity to support the shopping trips, a capacity deficiency may result. This problem is further exacerbated by jurisdictional boundaries that make it difficult for coordinated regional transit systems and routes to connect users in one jurisdiction with activities in another jurisdiction.

7.2.1.3 Declining Quality of Life Due to Natural Environments

It should be understood that the impact of transportation infrastructure and services on the surrounding land is an aspect of system performance. For example, if a roadway creates noise, pollution or aesthetic problems in a tourist or recreational area, those industries dependent on the tourism and recreation may suffer due to the aesthetics and environmental performance of the transportation system. If transportation infrastructure creates environmental or aesthetic problems for surrounding land uses, the property on the land and the viability of activities on the land suffer.

7.2.1.4 Land Uses Incompatible with Pedestrian and Bicycle Needs

The issue of density is described throughout this report as a key determinant of the feasibility of bicycle and pedestrian travel. According to the *Travel Characteristics Technical Report of MI Transportation Plan*, walking is the next most frequently used mode of travel after the automobile. If land uses lack sufficient density, and a sufficient mix of origins and destinations for pedestrian trips, distance and connectivity can become insurmountable performance barriers for such travel. It should also be noted that if land uses do not support connections between bicycle and pedestrian facilities and other modes, a system performance barrier could arise. An example of this would be a walkable neighborhood completely surrounded by uses through which the pedestrian cannot walk to get to a transit stop.

7.2.1.5 Congestion and Bottlenecks

Roadway congestion and bottlenecks affect the accessibility of land, making areas once suitable for a particular use less attractive locations. For example, a thriving retail center on a principal arterial roadway may become a less attractive and viable destination if the arterial becomes congested with traffic supporting more development along the corridor. When this happens, the land use planning that supported the center becomes outdated and

either the roadway capacity must be improved, or the land use must be changed (or both). Coordinated solutions such as access management and orderly development are common tactics for treating or preventing this type of performance barrier.

7.2.2 Opportunities

7.2.2.1 Role for Businesses in Developing and Providing Transit

A structure for collaboration between transit providers and businesses employing large numbers of transit users, or serving consumer markets comprised of transit users may trigger both workforce and market participation through better transit service. Such collaboration may involve location decisions and land use management changes at the local level. When such collaboration may occur, it is possible that the results could stimulate economic activity by making jobs and markets more available to workers and consumers, enhancing land values and improving the accessibility of Michigan's workforce to businesses.

7.2.2.2 Context Sensitive Solutions

Context sensitive solutions (CSS) can significantly enhance the value of transportation infrastructure by customizing the infrastructure or service to its natural and human environment. Context sensitive solutions vary, depending on the nature of the transportation infrastructure or service, and the surrounding environment. However, by enhancing the way in which projects are developed, it is possible that CSS can trigger economic activities by making them more accessible to users, or by protecting their overall value. For example, if a restaurant serves meals on an urban sidewalk, and the roadway adjacent to the restaurant needs improvement there may be an opportunity for a context sensitive solution. A design may be offered with provides greater separation between the sidewalk and the traffic, enhancing not only traffic safety but also the quality and value of the food service at the restaurant.

7.2.2.3 Co-location of Intermodal Freight Hubs with Shippers

Research in freight systems planning has explored the concept of Freight Villages and other transportation oriented manufacturing land developments. In Freight Villages and related developments, manufacturers with direct supply chain relationships are located on adjacent properties, greatly minimizing their dependence on the state's transportation infrastructure. When these collocated supply chain partners are arranged in close proximity to an intermodal freight facility (such as a major seaport or air cargo facility), there can be significant reductions in commercial VMT, as well as the associated pavement deterioration, capacity and safety costs associated with short and medium haul shipments. An added advantage for shippers is improved reliability, safety and timeliness of shipments, and overall reductions in transport costs.

7.2.3 Integrating Land Use

Integrating land use into Michigan's long-range planning entails consistently identifying those situations where collaboration between land use authorities and other stakeholders may complement improvements to highway, bicycle/pedestrian, freight, transit and safety oriented projects. When these situations are identified, decisions should be made to maximize the safety, efficiency and sustainability with which users access key activities in Michigan's economy.

Jurisdictional boundaries create incentive problems, with different land use and transportation planning entities often making decisions under different priorities, in different policy environments. Offering and articulating appropriate incentives in terms of the removal of performance barriers and the realization of opportunities is a key success factor for MDOT's contribution to land use and transportation planning in Michigan.

Appendix A: Transportation Planning and Land Use Tools

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Appendix A presents a listing of the land use planning tools and examples used by states and MPOs to integrate transportation and land use. The information below is copied directly from the FHWA Web site, <http://www.fhwa.dot.gov/planning/landuse/tools.cfm>

Tools are organized in the following topic areas:

Planning Activities

- Corridor Planning;
- Interchange Area Planning;
- Linking Planning and NEPA;
- Planning for Transit-Oriented Development;
- Regional Agency Support for Local Planning;
- Regional Visioning and Scenario Planning;
- State DOT Support for Comprehensive Planning;
- Subarea/neighborhood Planning; and
- Tier 1 EIS for Transportation Corridors.

Public Involvement

- Community Outreach Tools;
- Community Visioning Workshops and Charrettes;
- Land Use Scenario Development; and
- Visualization/Simulation Techniques.

GIS & Technical Analysis

- CommunityViz;
- CorPlan;
- GIS Environmental Mapping/Analysis;
- MetroQuest;
- Paint the Town/Paint the Region;
- PLACE3S;
- Rural Traffic Shed Model;
- Smart Growth Index; and
- Space Syntax/Ped-GriD.

Project Prioritization & Funding

- Funding for Streetscape, Urban Design, and Multi-modal Improvements ;

- Project Screening and Selection Criteria;
- State Fiscal and Regulatory Incentives; and
- Transit Corridor and Station Area Development Programs.

Design Guidelines & Standards

- Access Management;
- Context-Sensitive Design/Solutions;
- Local and Regional Road Design Guidelines;
- Model Zoning and Subdivision Ordinances;
- Pedestrian and Bicycle Facilities Design Guidelines/Programs; and
- Road Swaps and Transfers.

Planning Activities:

Corridor Planning State DOTs, MPOs, cities, and counties develop transportation corridor plans that consider land use as well as transportation issues. Some state agencies have developed handbooks for corridor planning as an aid to district staff and consultants when conducting planning studies.

Interchange Area Planning Agencies at various levels have developed and/or implemented land use plans and zoning overlay ordinances to guide land development around freeway interchanges. Interchanges become magnets for development, but unplanned development and unmanaged access can quickly lead to a breakdown of traffic conditions near the interchange, affecting both safety and capacity. State agencies and nonprofits have sponsored the development and adoption of model codes and regulations for interchange areas, while regional agencies and local jurisdictions have sponsored the development of interchange area plans that address access, local circulation, land uses, site design, buffers, and landscaping.

Linking Planning and NEPA Transportation planning agencies are increasingly expanding the scope of their statewide, regional, and corridor planning efforts to address NEPA issues, including land use impacts, at an early stage. Methods include: Collecting and using regional data on environmental conditions in the long-range transportation planning process; evaluating combined transportation and land use scenarios; involving Federal and state resource agencies in long-range transportation planning; conducting Tier 1 environmental analysis for transportation corridors; and recommending projects and policies in statewide and corridor plans that are designed to reduce environmental impacts.

Planning for Transit-Oriented Development Transit agencies, MPOs, and local jurisdictions have led planning processes focusing on existing or planned transit station areas and/or corridors. These processes may involve education and outreach on TOD principles and concepts; station area conceptual planning; market assessment; detailed station area plans;

development and adoption of overlay districts or other zoning changes to facilitate transit-supportive development; and application of other tools and incentives.

Regional Agency Support for Local Planning MPOs, Regional Planning Commissions (RPCs), and Councils of Government (COGs) have provided technical and/or financial assistance for local comprehensive planning and/or small-area planning activities that link transportation and land use. Financial support has been provided from Federal sources, including Surface Transportation Program (STP) and Planning (PL) funds, as well as from funds appropriated by state legislatures.

Regional Visioning and Scenario Planning MPOs and nonprofit/community groups have led public processes to develop a transportation and land use vision for a region or multi-jurisdictional corridor and to evaluate future transportation and land use scenarios. The results of this process are typically implemented through the next updates of the Long-Range Transportation Plan and Transportation Improvement Program, and through additional actions to encourage land use changes at the local level.

State DOT Support for Comprehensive Planning State DOTs have provided assistance for integrating transportation considerations into local comprehensive planning and land use considerations into statewide transportation planning. Activities have included the development of agency policies on considering land use in transportation planning, training for state DOT staff and consultants, and provision of technical and financial assistance for local governments.

Sub area/neighborhood Planning Local agencies have developed plans for a sub area that include both multi-modal transportation and land use strategies to address issues such as traffic circulation, parking, transit service, and pedestrian and bicycle access. Planning sub areas have included central cities, activity centers, and neighborhoods. Plans are implemented through capital improvements, changes to zoning, and other strategies.

Tier 1 EIS for Transportation Corridors A Tier 1 Environmental Impact Statement (EIS) is a broad environmental impact statement (e.g., for a general transportation corridor) that is prepared prior to a subsequent statement or environmental assessment on a more specific action (such as a specific highway alignment). The use of a tiered EIS approach to transportation corridor studies can assist in streamlining project development, by addressing large-scale issues up front (such as growth-related impacts) and then incorporating these issues by reference into a second-tier EIS dealing with specific projects and alignments.

Corridor Planning

Scale of Application: Corridor/sub area planning

Possible Implementing Agencies: State DOT, City/County, MPO/RPC

Examples:

- **Idaho DOT**

The Idaho Corridor Planning Guidebook helps ITD Division of Transportation Planning staff, in cooperation with local governments, develop long-range plans for transportation corridors. The long-range planning process described in this guidebook is intended to integrate transportation planning with land-use planning, and to coordinate local and state transportation planning efforts.

- **Illinois DOT**

Illinois (Statewide): This program, administered by the Illinois DOT, provides \$15 million over 5 years to help local governments develop plans that integrate transportation and land use/development decision-making. See: Illinois Tomorrow Corridor Planning Grants Case Study.

- **Kentucky DOT**

The Kentucky Transportation Cabinet (KYTC) developed the Bluegrass Corridor Planning Management Handbook, which describes a comprehensive approach to corridor planning that addresses land use issues as well. The handbook outlines a six-step process for conducting a corridor planning study, including getting organized, knowing the corridor, developing choices, selecting a preferred choice, implementation, and sustaining the vision. The handbook's principles have been applied in cities such as Bowling Green, where an overlay district was adopted in conjunction with a planned arterial road realignment. Contact: Brent Sweger, KYTC (502-564-7686)

- **New Jersey DOT**

As part of its Future in Transportation (FIT) program, New Jersey DOT is working with communities to integrate land use and transportation issues into corridor-level planning. The DOT-funded studies are addressing issues such as circulation systems, access management, and zoning as well as multi-modal transportation improvements. On the Route 31 corridor through Raritan Township and Flemington Borough, this study approach is resulting in a smart growth alternative to a previously proposed bypass, consisting of local road network improvements that can be built sooner, at lower cost, and with fewer environmental impacts. The NJ Office of Smart Growth has awarded a grant to Raritan Township to revise its master plan to accommodate the proposed roadway system. Contact: Gary Toth, New Jersey DOT (609-530-5262).

- **Utah DOT**

The Utah DOT (UDOT) worked to integrate land use planning into the study of the 40-mile Mountain View Corridor (MVC) on the outskirts of the Salt Lake City region. UDOT engaged Envision Utah, a non-profit organization that led a regional visioning effort, to lead a land use scenario planning process as part of the environmental analysis process for the MVC. The scenario planning process brought together communities to discuss future land use alternatives and how land use planning can support different

transportation options for the corridor. Contact: Teri Newell, Utah DOT (801-975-4807) or Peter Donner, Envision Utah, (801-538-1529).

- **Cities of Broomfield, Lafayette, and Louisville, and Boulder County (Colorado)**
In Denver's northwest suburbs, four communities came together in the 1990s to preserve open space while addressing common mobility needs. The communities established a nonprofit authority to construct a toll road as a link in Denver's circumferential highway system, while at the same time implementing strong land protection measures to ensure that the road would not simply become another conduit for suburban sprawl. Through inter-governmental agreements and funding from anticipated toll revenues, the communities designated and acquired 2,400 acres near the alignment to preserve as open space. The communities also revised zoning to focus development in two areas near planned interchanges. Contact: Charles Ozaki, City and County of Broomfield (303-438-6300); Ron Stewart, Boulder County (303-678-6278).

Other References:

- The [Transportation Research Board Access Management](#) Web site contains references on corridor planning and corridor preservation.
- The [Vermont Corridor Management Handbook](#) (Vermont Agency of Transportation, 2005) was developed to provide a technical resource for state and regional agency planners and their consultants who are undertaking the development of a transportation corridor management plan.

Interchange Area Planning

Scale of Application: Corridor/sub area planning

Possible Implementing Agencies: City/County, MPO/RPC, State DOT

Examples:

- **Georgia Department of Community Affairs (other state agency)**

The [Georgia Department of Community Affairs](#) has developed a model code for Interchange Area Development, as part of a set of model codes for communities that provide an alternative to traditional zoning regulations. The code addresses highway access, buffers and setbacks, architecture, lighting, and signage. The code was adopted from an interchange model overlay zoning ordinance prepared by the Clearwater Conservancy for communities in Centre County, Pennsylvania.

- **Charlotte (North Carolina) MPO**

The Mecklenburg-Union MPO sponsored an interchange analysis as a framework to guide land use and transportation improvements at interchanges along the I-485 outer loop freeway in Charlotte, North Carolina. At the time the study was undertaken, approximately one-third of the freeway was completed, with the other two-thirds in various stages of planning, design, or construction. The *I-485 Interchange Analysis* made recommendations to help ensure that future interchanges would function effectively and

that the area around those interchanges would develop in accordance with the community vision. Recommendations included: eliminating one interchange and delaying construction of some others; changing the design of some interchanges; constructing roundabouts; improving access management and connectivity; realigning and improving roads near the interchanges; improving conditions for bicyclists and pedestrians; changing adopted land use plans; and completing more detailed area plans for some interchanges. Since the completion of the analysis, many of these recommendations have been implemented, resulting in a transportation facility that will better serve existing and future development. Contact: Garet Johnson, Charlotte-Mecklenburg Planning Commission (704-336-8364).

- **Clearwater Conservancy (nonprofit) and local governments in Centre County, Pennsylvania**

As part of planning for Interstate 99 (I-99) in central Pennsylvania, the ClearWater Conservancy, a nonprofit organization, worked with local governments to conduct corridor planning and create and adopt an interchange overlay district ordinance. The overlay district has been adopted to some extent by governments within four of six planning districts in the I-99 corridor. The ordinance aims to maintain the land around the Interstate 99 as natural woodland, preserving the identity of townships, rather than encouraging the development of strip malls. The ordinance applies for a quarter mile from the center of each lane's right of way. Contact the Clearwater Conservancy (814-237-0400).

- **Oregon Department of Transportation**

The Oregon Department of Transportation (ODOT) creates Interchange Area Management Plans (IAMP) for every major newly constructed interchange. The IAMPs are created to reduce potential conflicts that can result from increased development around interchanges by ensuring that growth and development can occur without overloading the capacity of the new infrastructure. ODOT develops the IAMPs in collaboration with residents, property owners, community stakeholders, and local government officials. The plans must be adopted by local governments and the Oregon Transportation Commission before a Final Tier 2 Design Environmental Impact Statement will be published.

- **Vermont Department of Community Affairs (other state agency)**

The Vermont Department of Housing and Community Affairs, in coordination with the Vermont Agency of Transportation (VTrans) and other state agencies, has led the development of a state interchange planning policy to manage growth around freeway interchanges. The intent is to craft guidelines for towns to consider to direct growth away from interchanges. The VTrans access management program coordinator is the liaison to this program, and access management principles have been incorporated into the planning policy. Policy development has included pilot projects, including an interchange plan in Randolph that resulted in recommended zoning changes. Contact: Allan Wright, VTrans (802-828-2485).

Other References:

- Center for Urban Transportation Research. *Land Development and Access Management Strategies for Florida Interchange Areas*. Prepared for Florida Department of Transportation, 2000. Available from the [Transportation Research Board Access Management](#) Web site.

Linking Planning and NEPA

Scale of Application: State/regional planning, corridor/sub area planning

Possible Implementing Agencies: State DOT, MPO, other state agency

Examples:

- **Florida DOT**

Florida DOT's (FDOT) [Efficient Transportation Decision-Making Process \(ETDM\)](#) consists of both a process and a GIS tool to bring environmental considerations into the early stages of the statewide transportation planning and project development processes. The ETDM process provides a link between land use, transportation, and environmental resource planning through early and continuous involvement of planning, consultation, and regulatory and resource agencies. An interagency team reviews projects in the early stages of both the planning and project programming processes. An interactive GIS database assists the team in identifying the potential direct, indirect, and cumulative impacts of projects. Information about projects screened through the ETDM process is available to the public on the [ETDM public access web site](#). FDOT is collecting performance measures to assess the effectiveness of the process. Contact: Larry Barfield, FDOT (850-414-5260).

- **Fort Collins (Colorado) MPO**

With the support of FHWA, FTA, EPA, and the Colorado DOT, the [North Front Range MPO \(NFRMPO\)](#) undertook a pilot project to increase consideration of environmental impacts and resource agency involvement early in the transportation planning process. Known as Strategic Transportation, Environmental and Planning Process for Urbanizing Places (STEP UP), the project included a model planning process with early and continuous resource agency involvement and guidelines for environmental review and prioritization of transportation projects; development of a GIS-based tool for identifying environmental impacts of projects; and a cumulative effects assessment for the regional transportation plan. Contact: Suzette Thieman, NFRMPO (970-416-2257). *See also: [STEP UP Phase 1 Report](#) (Colorado DOT, 2005).*

- **Milwaukee (Wisconsin) MPO**

The [Southeastern Wisconsin Regional Planning Commission \(SEWRPC\)](#) is the MPO as well as the areawide comprehensive physical infrastructure planning agency for the seven-county Southeastern Wisconsin Region. The Commission's planning addresses transportation, land use, water resources, parks and open space, farmland preservation,

and environmental/natural habitat areas. The Commission's transportation planning is based upon a regional land use plan, and links to NEPA by using the Commission's extensive database on land use and environmental resources. The transportation plan was created with consideration of land use objectives as well as secondary and cumulative impacts of plan alternatives. A key aspect of the process is the involvement of Federal resource agencies to identify critical issues from a regional perspective and to assist in developing transportation and land use projects and policies. SEWRPC expects this involvement to result in streamlined project delivery. Contact: Ken Yunker or David Jolicoeur, SEWRPC (262-547-6721). *See also: Presentation at the 2005 Association of Metropolitan Planning Organizations (AMPO) Annual Conference.*

- **North Carolina state agencies, including DOT**

The Ecosystem Enhancement Program (EEP), a compensatory mitigation system, was established in 2003 by the North Carolina Department of Environment and Natural Resources (NCDENR), in partnership with the North Carolina DOT (NCDOT) and the United States Army Corps of Engineers, to speed project development and delivery while protecting the environment. Rather than focusing on individual highway project impacts, the EEP concept operates programmatically, using watershed plans and considering cumulative impacts associated with a given watershed. The program funds highway project mitigation activities, such as stream and wetlands protection and restoration, at other locations within the same watershed and in advance of the actual project work. Funding is provided from Federal and state transportation sources through the statewide transportation improvement program (STIP). As of late 2005, EEP is on schedule to meet NCDOT's mitigation needs in all watersheds. Contact: Bill Gilmore, NCDENR (919-715-1412).

- **City of St. George (Utah)**

As part of a planning and environmental assessment process for the proposed Southern Connector highway, the City of St. George, Utah used ecological data and a GIS visualization and community indicators model to evaluate alternative growth plans for the area near the highway. The result was a plan that will reduce environmental impacts and transportation demands related to highway-supported growth. See: Full project description under "CommunityViz."

Other References:

- FHWA and FTA have published program guidance on "Linking the Transportation Planning and NEPA Processes" and have conducted peer exchanges and offer facilitated workshops on the topic. Summary reports are available for peer exchanges held in Baltimore, North Carolina, and Pittsburgh.
- The National Highway Institute offers a course entitled "Linking Planning and NEPA: Towards Streamlined Decision Making" (FHWA-NHI-151041). The course is offered both as a three-day course and as a four-hour executive session.

Planning for Transit-Oriented Development

Scale of Application: Site planning and development

Possible Implementing Agencies: State DOT, MPO/RPC, City/County, Transit Agency

Examples:

- **Columbus MPO and transit agency (Ohio)**

The Mid-Ohio Regional Planning Commission (MORPC) and the Central Ohio Transit Authority (COTA) jointly led a public process to create development concepts for three potential transit-oriented development (TOD) sites: urban, developed suburban, and developing suburban. The purpose of the process was to advance transit-supportive land use planning practice in the Columbus region, in advance of a planned light-rail transit system. Contact: Chris Gawronski, MORPC (614-233-4166). (Reference: *Transit-Oriented Development Regional Demonstration Project*. Prepared for MORPC by ACP - Visioning & Planning, Ltd., July 2002.)

- **Burlington (Vermont) RPC**

The Chittenden County Regional Planning Commission (CCRPC) in Burlington, Vermont published a Transit-Oriented Design Manual in 2002. The guidelines are intended to show how the development community and municipalities can include transit users in the market it expects to serve with large or small-scale real estate development projects. They also are intended to show planners and designers what elements may be included in their plans to create transit-oriented design. The manual is appropriate for smaller communities that wish to design for transit. Contact: Ian MacDougall, CCRPC (802-658-3004).

- **Florida DOT**

The Florida DOT (FDOT) has developed a variety of tools and undertaken efforts to promote transit-oriented design in bus as well as rail corridors throughout the state. FDOT's Transit Office produced a report entitled *Accessing Transit* that includes a discussion of design principles to support transit access, as well as a CD-ROM of TOD resource materials. Two staff persons within the Transit Office support TOD activities and planning. In addition, FDOT's District 5 office in Fort Lauderdale has funded charrettes, transportation corridor studies, and neighborhood plans that address land use issues, including TOD and transit-supportive design. Contact: Amy Datz, FDOT Transit Office (850-414-4239); or Jeff Weidner, FDOT District 5 (954-777-4670).

- **Maryland DOT**

The Maryland DOT (MDOT) has supported TOD through various efforts, including sponsoring station area planning pilot studies, soliciting TOD proposals for surplus state property in station areas, and basing alignment and station location decisions to maximize TOD and economic development opportunities. To develop a plan for the West Hyattsville on Washington's Metrorail system, the agency brought together the full

range of stakeholders who need to be involved in implementing the plan (including local elected officials, planning and zoning staff and commissions, resource and public works agency staff, landowners, neighbors, and others) to ensure that commitments to implementing the plan are solidified and carried out. Contact: Don Halligan, MDOT (410-865-1294).

- **Raleigh-Durham transit agency (North Carolina)**

The Triangle Transit Authority (TTA) in Raleigh-Durham, North Carolina led TOD planning efforts in support of the first fixed-guideway transit system for the region, a diesel multiple unit system linking Raleigh, Durham, and Chapel Hill. TTA selected station locations in part based on future growth potential, and undertook station area planning activities to assess available sites and market demand. In conjunction with construction of the system, TTA has selected a Master Developer team that will manage the development process for rail station sites that have been identified as consistent with TTA's goals for TOD. Contact: Juanita Shearer-Swink, TTA (919-485-7412).

- **Seattle (Washington) MPO**

The Transit Station Communities Project, led by the Puget Sound Regional Council (PSRC) in Seattle, Washington, has supported the development of station area plans for commuter rail stations serving smaller town centers between Seattle and Tacoma. The MPO used Transportation, Community, and System Preservation Program (TCSP) funds to provide technical assistance to local governments, and especially to help address particularly difficult issues such as parking management. Involvement of the MPO not only provided planning capacity to local jurisdictions with little experience developing small-area plans, it also raised the visibility of these planning activities, providing them with an incentive to do a thorough job of planning. Contact: Ben Bakkenta, PSRC (206-464-5372).

Other References:

- Cambridge Systematics, Inc. The Role of State Departments of Transportation in Transit-Oriented Development. Prepared for NCHRP Project 25-25 Task 20, 2006.
- Cervero, Robert, et al. *Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects*. Transit Cooperative Research Program (TCRP) Report 102, 2004. This report discusses issues related to development adjacent to transit including institutional issues, impacts and benefits, implementation strategies, and urban design.
- Dunphy, Robert; Deborah Myerson and Michael Pawlukiewicz. *Ten Principles for Successful Development around Transit*. Prepared for Urban Land Institute, 2003. This non-technical handbook describes keys to achieving TOD from a developer/market perspective.
- Lefaver, Scott, et al. Construction of Transit-Based Developments. Mineta Transportation Institute report 01-05, September 2001. This report reviews policies and legislative

programs that can be adopted at all levels of government to encourage transit-based development.

Regional Agency Support for Local Planning

Scale of Application: State/regional planning, local comprehensive planning, site planning and development

Possible Implementing Agencies: MPO/RPC

Examples:

- **Wilmington (Delaware) MPO**

The Wilmington Area Planning Council (WILMAPCO) has funded local agencies to make changes to comprehensive plans to include "mobility-friendly street design standards" as an option for developers in new development. Alternative design standards have been adopted in Cecil County, Middletown, and Chesapeake City. Contact: Heather Dunigan, WILMAPCO (302-737-6205)

- **Atlanta (Georgia) MPO**

The Atlanta Regional Commission's (ARC) Livable Centers Initiative provides planning grants for communities located in existing activity centers to develop plans that enhance livability and mobility. Using Federal transportation funds, the program has provided \$1 million annually in planning grants since 2000, and the region's long-range transportation plan allocates \$350 million to implement projects identified in plans. Planning efforts funded by the program are beginning to result in mixed-use town centers and transit-oriented development projects in cities such as Douglasville, Chamblee, and Duluth. Contact: Dan Reuter, ARC (404-463-3305).

- **Albany (New York) MPO**

The Capital District Transportation Committee (CDTC) initiated its Community and Transportation Linkage Planning Program in 2000 to help integrate land use and transportation decisions. The program provides CDTC staff or private consultant support to local community planning initiatives. CDTC has committed approximately \$100,000 annually in staff time and \$300,000 annually in consultant resources - approximately 25 percent of its planning work program - to undertake collaborative, jointly-funded local land use and transportation planning studies. Forty-one such studies in 25 municipalities have been undertaken through 2005. The studies are helping to implement key policies of the New Visions regional transportation plan through local adoption of land use plans, highway and transit designs, zoning ordinances, driveway standards, pedestrian and bicycle accommodation, and other activities. The program has proven very successful in engaging the MPO with land use planning issues and generating project candidates for CDTC's transportation improvement program. A regional roundtable of municipal planners (with mandatory participation of Linkage study municipalities) meets quarterly to allow communities to

build upon each other's experiences. Contact: Sandra Misiewicz, CDTC (518-458-2161). See the [Albany, NY Case Study](#).

- **Berkeley-Charleston-Dorchester (South Carolina) COG**

The Berkeley-Charleston-Dorchester (South Carolina) COG, the MPO for the region, assists local and county governments with comprehensive plan updates and zoning ordinances. The COG's role in providing planning assistance has allowed it to work with local jurisdictions to incorporate "smart growth" recommendations from a regional growth options study into local plans and zoning. Related COG activities to implement the Growth Options study recommendations include updating the long-range transportation plan to address urban and facility design; encouraging a "complete streets" approach to facility design that accommodates all modes; conducting focus groups on multi-jurisdictional land use, connectivity, and transportation coordination at a sub regional level; partnering with public health, schools, and bicycle and pedestrian organizations to promote bicycling and walking; and partnering with the development community to find ways to address the "how to" get to the vision for the region. Contact: Dan Hatley or Haila Maze, BCDCOG (843-529-0400).

Regional Visioning and Scenario Planning

Scale of Application: State/regional planning, corridor/sub area planning

Possible Implementing Agencies: MPO/RPC, City/County, Other (State planning agency, nonprofit)

Examples:

- **Binghamton (New York) MPO**

Faced with the challenge of a slowly declining and aging population, the Binghamton Metropolitan Transportation Study (BMTS) decided with its 2004 update of the long-range transportation plan to undertake a scenario planning process to address transportation, land use, and economic development issues simultaneously, with the objective of linking transportation to regional revitalization. An extensive public involvement process was undertaken to determine community goals, design principles, and growth scenarios. Scenarios included "outward" and "inward" development under "trend" and "growth" conditions. Study leaders and the public came to a consensus to focus on revitalization and redeveloping the urban core communities. The long-range transportation plan (titled *Transportation Tomorrow 2030 - Placemaking for Prosperity* and adopted in 2005) is reflecting that consensus by focusing transportation investment in the urban core. Contact: Steven Gayle, BMTS (607-778-2443).

- **Grand Rapids (Michigan) MPO**

Beginning in the early 1990s, The Grand Valley Metropolitan Council (GVMC) led the development of "Blueprint" principles and has since worked to implement these principles through a collaborative process with a series of sub-regional groups. Seven

groups were formed around common geography and planning issues. The process included both local charrettes to plan identified "livable areas" in these sub regions, as well as broader planning techniques to address the unique regional qualities of each area. Since 2000, the MPO has annually given out awards recognizing projects and programs – such as the City of Grand Rapids Master Plan, the West Michigan Sustainable Business Forum, and a number of development projects – consistent with Blueprint principles. Contact: Andy Bowman, GVMC (617-776-7611).

- **City of Charlotte (North Carolina)**

In 1994, the Charlotte City Council and Mecklenburg Board of County Commissioners adopted the Centers and Corridors Plan for land use and transportation in the region. The plan focuses on increasing in-fill and redevelopment along the corridors and in the center of the city for compact, mixed-use, pedestrian-friendly development near transit station areas. The City, County, and Charlotte-Mecklenburg MPO have worked to implement this plan through actions such as adopting a regional transit plan to support the land use plan, making investments in light rail and busway transit; conducting station area planning to promote development in station areas; and adopting alternative street design standards. *See also Federal Highway Administration Domestic Scan Tour II: Land Use and Transportation Planning Coordination (November 2003).*

- **Lansing (Michigan) MPO**

With the support of a fiscal year (FY) 1999 grant through FHWA's Transportation and Community and System Preservation (TCSP) Pilot Program, the Tri-County Regional Planning Commission (TCRPC), the MPO for the Lansing region, led an extensive public and stakeholder outreach process to develop a growth vision for the region, which was adopted in 2003. TCRPC then established a committee to oversee implementation efforts, which have included adopting changes to local plans and zoning (such as downzoning of rural areas), incorporating plan principles into the long-range transportation plan, and screening candidate transportation improvement program projects against land use criteria. Contact: Paul Hamilton, TCRPC (517-393-0342).

- **Seattle (Washington) MPO**

In 1990, the Puget Sound Regional Council (PSRC) adopted VISION 2020, a transportation and land use vision for the region. VISION 2020 called for focusing growth in 21 urban centers and 8 manufacturing/industrial centers. The urban centers were to include concentrations of population and employment in mixed-use, walkable environments, connected by high-capacity transit service. VISION 2020 has been implemented through local plan development, voluntary regional review of plans for consistency, MPO-led outreach and demonstration programs, policies in the long-range transportation plan, and capital projects in the transportation improvement program. PSRC also has evaluated the extent to which development is occurring consistent with VISION 2020, and is undertaking an extensive process (scheduled for completion in

2007) to update the vision for the year 2040. Contact: Ben Bakkenta, PSRC (206-464-5372).

Other References:

Visioning efforts have been undertaken in numerous other areas throughout the country. The Denver MPO led one such effort in the early 1990s. Efforts that are more recent have been undertaken by MPOs in areas such as Charlottesville, Virginia; Lansing, Michigan; and Los Angeles, California; and by non-profit groups in Concord, New Hampshire and Salt Lake City, Utah. See:

- Denver Regional Council of Governments: Metro Vision 2020.
- Federal Highway Administration TCSP Program's Case Study #13: Implementing a Regional Vision (2004) Provides descriptions of projects in Charlottesville, Concord, Lansing, and Salt Lake City.
- Surface Transportation Policy Project. "Regional Visioning Projects in California and Nationwide." Contains links to 9 projects in California and an additional 14 in other States.
- Southern California Association of Governments: Compass Southern California.
- University of Utah and Federal Highway Administration: Scenario Planning Digital Library. Contains over 80 plans and analysis reports from various scenario-planning processes.

Some additional regional and community visioning activities, as well as tools and methods to support visioning processes, are described under "public involvement" and "GIS and technical analysis." [LinkTo: Respective Tool sections]

State DOT Support for Comprehensive Planning

Scale of Application: Statewide planning, corridor/sub area planning, local comprehensive planning

Possible Implementing Agencies: State DOT

Examples:

- **Colorado DOT**

The state of Colorado's Moving Forward Initiative allows Colorado Department of Transportation (CDOT) to collaborate with local governments on transportation planning. In addition, the state awards Heritage Planning Grants, which allow local communities submitting joint applications to address regional issues such as the environment, development, regional transportation, and energy use.

- **Idaho DOT**

Idaho DOT has published a guide entitled, Transportation in Your Local Comprehensive Plan: a Guide for Local Government Officials. This document is designed to help

planning and zoning commission members and local elected officials in Idaho prepare the transportation component of their comprehensive plan. It is divided into five chapters, each focusing on one of five basic tasks in the planning process: 1) getting organized in transportation planning; 2) collecting data and analyzing information; 3) developing transportation policies; 4) developing implementation strategies; and 5) coordinating with other plan components.

- **Indiana DOT**

The Indiana DOT (INDOT) will be providing grants in 2006 and 2007 for local jurisdictions in rural southwest Indiana to support land use and economic development planning in advance of the proposed new I-69 freeway linking Indianapolis to Evansville. Contact: Steve Smith, Manager, INDOT Long Range Transportation Planning Section (317-232-5646).

- **Wisconsin DOT**

The Wisconsin DOT (WisDOT) has provided internal guidance and training for its headquarters and district staff on participation in local comprehensive planning activities (WisDOT Transportation and land use). WisDOT also has developed guidance for local jurisdictions on considering local and statewide transportation issues in their comprehensive planning activities. As a result, district engineers and planners are working closely with local jurisdictions to coordinate the department's corridor planning activities with local land use planning, and to provide input into local comprehensive plans that affect important state travel corridors. Contact: Tanace Matthiesen, WisDOT Bureau of Equity and Environmental Services (608-264-8716).

Other References:

- Land Use and Economic Development in Statewide Transportation Planning, 1999 (PDF Only) Prepared by the Center for Urban Transportation Studies, University of Wisconsin-Milwaukee, in cooperation with the Wisconsin Department of Transportation, for the FHWA (1999). This report provides an overview of state DOT activities related to land use planning in six categories: land use/transportation planning; state land use planning capabilities; education/technical assistance; access management; land use controls; and economic development.

Sub area/Neighborhood Planning

Scale of Application: Corridor/sub area planning

Possible Implementing Agencies: City/County

Examples:

- **City and County of Denver (Colorado) and the Stapleton Development Foundation (nonprofit)**

The Stapleton Development Plan, adopted in 1995, establishes a vision of the reuse of the 4,700-acre former Stapleton Airport site in Denver, Colorado. The plan creates a

network of urban villages, employment centers, and open space, and extends adjacent arterial and local street block patterns onto the site. The street grid, pedestrian-oriented design, mix of uses, and continuous bikeway system support travel by alternative modes and will reduce vehicle traffic on adjacent arterials. Construction began in 2001 and will continue over a 15 to 20 year period. *See also Federal Highway Administration Domestic Scan Tour I: Land Use and Transportation Coordination.*

- **City and County of Honolulu (Hawaii)**

The Waikiki Livable Community Project was a livability and mobility study that examined the relationship of the Waikiki's street network and transportation environment to Waikiki's residents, stakeholders, businesses, tourists and employees. The project emphasized an extensive public involvement and outreach effort that led to the formulation of a "Pedestrian First" policy to enhance and improve the pedestrian environment while maintaining essential transportation access and services in Waikiki. A unique aspect of the study was the development of "street visions" for the three main arterial street corridors and connecting local street network that traverse Waikiki. The "visions" for the street network revolve around "vision statements" that articulate the desirable character, enhancements and improvements for the street system in Waikiki. Contact: Brian Suzuki, City and County of Honolulu (808-527-6880). See also: "Waikiki Livable Community Project: Livability and Mobility Report" (City and County of Honolulu, 2003).

- **City of Portland (Oregon)**

The City of Portland's Central City Transportation Management Plan is a policy based on the theme "growth with livability," which aims for concentrated growth within the Central City area. The plan is a multi-modal transportation policy that targets transportation improvements to support the city's land use objectives, including promoting mixed-use and higher-density development in the center city in order to minimize regional vehicle travel. Policies and actions in the plan address parking management, transit service, pedestrian and bicycle improvements, and traffic circulation improvements.

Tier 1 EIS for Transportation Corridors

Scale of Application: State/regional planning, corridor/sub area planning

Possible Implementing Agencies: State DOT, City/County, Transit Agency

Examples:

- **Riverside County (California)**

Riverside County Transportation Commission (RCTC) has undertaken a "Tier 1" EIS process to preserve and plan for major transportation corridors in conjunction with county-wide habitat and land development planning. Through the Community and Environmental Transportation Acceptability Process (CETAP), the county is using GIS

data on high-priority conservation areas, identified through a parallel multi-species habitat planning effort, to select transportation corridors that reduce ecological impacts by avoiding sensitive areas or minimizing fragmentation of these areas. The county-wide planning process also includes the development of land use planning alternatives to support the transportation corridors. In 2004, a Record of Decision was issued on a Tier 1 EIR/EIS for a north/south transportation corridor. Contact: Cathy Bechtel, RCTC (951-787-7141).

- **Colorado DOT**

The Colorado DOT (CDOT) has undertaken a Programmatic EIS to identify solutions for the I-70 Mountain Corridor between Denver and Glenwood Springs. The PEIS examined the indirect impacts of alternatives, including land use and development patterns, and the resulting impact on various environmental indicators. Contact: Cecilia Joy, CDOT (303-757-9112).

- **Washington State DOT**

The I-405 Corridor Program is a partnership among communities, elected officials, agencies, and advocacy groups to define a 20-year transportation vision for the 30-mile I-405 corridor in east suburban Seattle. Led by the Washington State DOT (WSDOT), the program undertook a streamlined EIS approach to reach consensus on a \$7 billion transportation package to address mobility and access needs. Obtaining input from permitting agencies at an early stage allowed for timely decision-making and generated "buy-in" for a multi-modal mix of solutions with broad-based support. The solution package has "smart growth" principles at its core and includes \$95 million for land use strategies. The I-405 Corridor Program was incorporated into the Metropolitan Transportation Plan in 2002. Contact: Michael Cummings, WSDOT (206-464-6223). See the Seattle, WA: I-405 Corridor Program Case Study.

Public Involvement:

Community Outreach Tools State, regional, and local agencies have developed educational/outreach tools to raise the level of awareness about the connection between land use and transportation and how different options support each other. These tools have been used in regional and local comprehensive planning and visioning efforts.

Community Visioning Workshops and Charrettes Communities, as well as state and regional transportation organizations, are increasingly applying workshop or charrette approaches to community planning that provide a more intensive, hands-on public involvement experience than traditional methods such as public hearings or surveys. A workshop or series of workshops may be held in which members of the public work together to identify community objectives, desired outcomes, specific problem areas, and solutions to problems. A charrette is an intensive, multi-day series of creative sessions in which a team concentrates on specific design problems with citizens and presents solutions. Workshops and charrettes have been successfully applied to develop plans covering transportation, land use, and other issues for

communities, specific neighborhoods, transportation corridors, and transit-oriented development sites.

Land Use Scenario Development State and regional agencies and non-profit groups have used workshop settings to tap the knowledge of local officials, staff, and the general public to develop future land use scenarios for a region, corridor, or community. The scenarios are developed using "chips" representing units of development that are allocated to different areas on a base map of the community. Increasingly GIS tools are being adopted to for this process, in addition to or to replace the use of "hard copy" maps and chips.

Visualization/Simulation Techniques such as visual preference surveys and computer-based design simulation have been applied to help citizens understand how different transportation and/or development alternatives will look. These techniques have been applied both in land use planning and in the design of transportation facilities.

Community Outreach Tools

Scale of Application: State/regional planning, local comprehensive planning, site planning and development

Possible Implementing Agencies: MPO/RPC, City/County

Examples:

- **Hartford (Connecticut) MPO**

The Capitol Region Council of Governments (CRCOG) in Hartford developed and distributed a Livable Communities Toolkit describing practical approaches to regional and local development. The subsection *Tools for Towns* covers eight development topics from agriculture preservation to rethinking zoning. The toolkit was developed to support an education and outreach project on regional growth issues, which also included a public opinion survey, visual preference survey, workshops, and focused planning work in an urban neighborhood and a semi-rural town. CRCOG has received feedback from several people throughout the state who are using the guide. Contact: Linda Osten, CRCOG (860-522-2217).

- **Kansas City (Missouri) MPO**

The Mid-America Regional Council's (MARC) Creating Quality Places guidebook includes case studies and tools illustrating development practices that support improved livability and reduced vehicle-travel. To support MARC's Smart Choices project, over 1,900 CDs containing the guidebook were distributed to local government officials, developers and builders, engineers and architects, civic leaders and others in the Kansas City region. The guidebook is also available on the Internet. MARC also produced a Small Cities Toolkit to assist smaller communities in considering solutions to development issues, and has formed a First Suburbs Coalition, involving 19 post-World War II cities, to focus on residential reinvestment, commercial development, and infrastructure maintenance and improvement. MARC has worked with homebuilders

and remodeling industry associations in these efforts and notes that its outreach work has influenced redevelopment projects in several first tier suburbs, including Raytown and Gladstone. Contact: Marlene Nagel, MARC (816-474-4240); or Dean Katerndahl, MARC (816-474-4240) regarding First Suburbs work.

- **Dover (New Hampshire) RPC**

The Strafford Regional Planning Commission in Dover, NH published a briefing titled "How to Link Land Use and Transportation Planning." The briefing provides an overview of land use-transportation relationships and describes basic techniques such as nodal development, walkable communities, access management, master planning, site/subdivision review, and driveway placement. The briefing has been distributed to over 2,000 elected officials, planning board members, conservation commissions, and other interested persons in the region. The SRPC reports receiving considerable positive feedback on the briefing and that it is serving as a background for local governments to address issues such as access management along state route 11. Contact: Cynthia Copeland, SRPC Executive Director (603-742-2523).

Community Visioning Workshops and Charrettes

Scale of Application: Corridor/sub area planning, transportation project development, local comprehensive planning

Possible Implementing Agencies: State DOT, City/County, MPO/RPC, Transit Agency

Examples:

- **Hartford (Connecticut) MPO and Town of Suffield**

As one component of a regional growth project, the Capitol Region Council of Governments (CRCOG) worked with the rural town of Suffield to conduct a community-visioning workshop. At this three-hour workshop, attended by elected officials, town staff, and citizens, participants were divided into small groups, given base maps of the town, and asked to draw on the maps and make recommendations. Following the workshop, project consultants synthesized the results of the workshops into a set of recommendations for the town. The town has since implemented a number of these recommendations. For more information, see the Suffield, CT: Charrette-based Planning Case Study.

- **Treasure Coast (Florida) RPC**

The Treasure Coast Regional Planning Council (TCRPC)'s Urban Design Studio provides assistance to its member communities to address land use and transportation planning issues. The studio has sponsored a series of planning charrettes for the communities of Indian River, St. Lucie, Martin, and Palm Beach. More recently, TCRPC has worked with other regional planning councils to host charrettes in Dade, Broward, Flagler and Polk counties. Each charrette lasts seven to ten days, during which time residents, landowners, staff, elected officials, and other participating agencies work with a team of

designers to produce a master plan for the revitalization and growth of their community. A steering committee is created by the local government in advance of the charrette. An informational brochure is available on the TCRPC web site. Contact: TCRPC Urban Design Studio, Marcela Cambior (772-221-4060) or Michael Busha, TCRPC Director (772-221-4060).

- **Teton County (Wyoming)**

To address transportation and land use issues in the rural community of Wilson, Wyoming, Teton County led a weeklong community charrette that considered roadway design alternatives, pedestrian and bicycle access, future land use designations, and maintaining housing affordability. The charrette included a mix of public presentations, small-group discussions, workshops, and meetings with business owners. In an iterative process, the planning team presented concepts to the public, obtained feedback, and refined and developed the concepts. The results of the charrette included a Corridor Plan for Highway 22, a Community Plan encompassing all of Wilson, and a Mixed-Use Village Plan for the center of Wilson. Nearly 130 people participated. Contact: Paula Stevens, Teton County (307-733-3959).

Other References:

- Ames, Steven C., ed. (2001). *Guide to Community Visioning*. American Planning Association Planners Press: Chicago, IL.
- The National Charrette Institute is a nonprofit educational institution that helps communities achieve transformation through collaborative planning processes. NCI offers a "Charrette Start-Up Kit" that provides an introduction to charrette techniques.

Land Use Scenario Development

Scale of Application: State/regional planning

Possible Implementing Agencies: MPO/RPC, City/County, Other (nonprofit)

Examples:

- **Sacramento (California) MPO**

As part of the Sacramento Blueprint regional visioning project, interactive GIS-based tools were used at workshops to help people test alternative development scenarios and their impacts. At a series of neighborhood workshops organized by the Sacramento Area Council of Governments (SACOG), participants were shown a base case land use map and asked to modify the zoning as they saw fit. Scenarios developed at a neighborhood level were then aggregated to the county level and used in county-wide workshops. For more information, see the SACOG website at <http://www.sacog.org/mtp/index.cfm>.

- **City of Fort Worth (Texas)**

A transit corridors project led by the City of Fort Worth focused on identifying opportunities for transit-supportive development in 10 "urban villages" along five significant transit corridors. A series of public meetings and workshops were held with local property owners, neighborhood association leaders, and other interested parties. At one set of workshops, participants were given a set of game pieces corresponding to different types of land use (e.g., mixed-use, rail station, landscaping) along with a price tag. This exercise helped participants think about development concepts that would support transit and urban design objectives, while recognizing budget constraints. Contact: Dana Burghdoff, City of Fort Worth (817-392-8018).

- **Envision Utah (nonprofit)**

The non-profit Envision Utah used an allocation workshop approach both to develop a regional Quality Growth Scenario and to help create community plans. The Nebo Community Vision project provides one example. On a workshop map, participants first identified all lands worthy of inclusion in a green space system. They were then asked to place the projected 2020 population increase within their community's boundary or annexation declaration. Development was placed by means of "chips," placeholders representing a constant acreage with a population that varied by development type. Development types range from "rural" to "conservation subdivision" to "main street." Quality Growth Scenario principles are beginning to be reflected in projects such as Daybreak, a 4,100-acre master-planned community situated adjacent to a proposed light rail station and featuring an extensive network of parks and open space, water-saving and energy-efficient building and site design, and a mixed-use, walkable development plan. Contact: Peter Donner, Envision Utah, (801-538-1529).

Visualization/Simulation Techniques

Scale of Application: State/regional planning, corridor/sub area planning, transportation project development, site planning and development

Possible Implementing Agencies: State DOT, MPO, City/County, Transit Agency

Examples:

- **Cuba La Cueva, New Mexico**

The Federal Lands Highway (FLH) Division uses visualization techniques to incorporate context-sensitive solutions into their projects. The Cuba La Cueva project involved a road re-alignment and a proposed bridge through a scenic valley. The FLH designer utilized a series of software programs (Microstation, 3D Studio Max and Photoshop) to render the proposed bridge. The simulated photos allowed FLH officials to accept a design concept that would be minimally intrusive to the surrounding scenic area. Contact: Tom Puto, FHWA (303-716-2087).

- **Hartford (Connecticut) MPO and Town of Suffield**

As one component of a regional growth project, the Capitol Region Council of Governments (CRCOG) worked with the rural town of Suffield to conduct a Visual Preference Survey. The survey was instrumental in leading the town to adopt changes to plans and zoning to preserve rural areas and allow mixed-use development in town and village centers, and to undertake pedestrian and streetscape improvements to the town's Main Street. For more information, see the Suffield, CT: Charrette-based Planning Case Study.

- **City of Lakewood, Colorado**

The City of Lakewood used 3-D visualization tools to visualize two future transportation-oriented developments planned in conjunction with the Denver Regional Transit District's proposed West Corridor light rail transit project. The visualization includes movies as well as still images illustrating proposed station designs, alternatives for the build-out of surrounding neighborhoods, and design treatments for adjacent roadways. The visualization was used to support neighborhood-based station area planning activities and the evaluation of alternative build-out scenarios. Contact: Roger Wadnal, City of Lakewood (303-987-7519).

- **University of Kentucky**

The Kentucky Transportation Center has applied a technique known as Casewise Visual Evaluation (CAVE) to allow people to express their design preferences regarding a roadway or transportation-oriented development. CAVE can capture preferences for various combinations of design features and also can be applied in as little as a one-hour public meeting. It has been applied to rural highway corridor design in central Kentucky and to urban light rail transit system in Louisville. Contact: Ted Grossardt, University of Kentucky Transportation Center (859-243-0971).

- **Olympia (Washington) MPO**

The Thurston Regional Planning Council (TRPC) overlaid aerial photos onto topographic relief maps to create "flyover" images of development patterns. The images are stitched together in a movie that illustrates different patterns of development. The flyover images were used in region-wide policy-maker forums to bring elected officials together to discuss transportation and land use issues from a regional perspective. One outcome of the forum was the Vision Reality Task Force project, which took a closer look at how the visions and policies in the region's comprehensive plans compare to actual existing conditions. To continue this project, TRPC is initiating a process to discuss how the region's growth trends fit into and are impacted by larger trends originating in the Seattle area, and how to better manage these pressures. TRPC reports that the flyover tool was useful in helping policy-makers understand the significance of their everyday decisions, more fully appreciate the transportation-land use connection, and support the work of the Vision Reality Task Force. Contact: Thera Black, TRPC (360-956-7575).

Other References:

- See also the tools described under “GIS and Technical Analysis,” many of which can be used for visualization and simulation.

GIS and Technical Analysis:

CommunityViz CommunityViz is a tailored GIS software package allows users to create and manipulate a virtual representation of a town and explore different land use scenarios.

CorPlan CorPlan is a GIS and spreadsheet-based model to assist in creating alternative regional development scenarios as input to a travel demand model. CorPlan estimates regional land development potential using prototypical "community elements" as building blocks. Each element represents a quarter-mile diameter area and is illustrated by a photograph and plan diagram that conveys its visual characteristics. Each element also has a unique set of socioeconomic and land use characteristics. Elements are manually assigned to different areas and then corresponding data are aggregated using GIS and used as input to the travel demand model.

GIS Environmental Mapping/Analysis State, regional, and local agencies, as well as non-profit organizations, have undertaken database development, mapping, and analysis of land use, community, and environmental features using geographic information systems (GIS). These databases and analysis tools have been used to assist in transportation facility routing and planning that minimizes land use, community, and environmental impacts.

MetroQuest MetroQuest is a regional scenario planning/analysis tool developed in Canada. MetroQuest allows agency staff and workshop participants to create regional transportation and land use scenarios on the fly, see scenarios evolve over time, evaluate key tradeoffs, examine scenarios in detail, and compare scenarios side by side. Underlying MetroQuest is a model linking demographics, land use, transportation, the macroeconomy, infrastructure, air quality, water, and energy.

Paint the Town/Paint the Region Paint the Town/Paint the Region is a GIS-based tool used to develop demographic forecasts at a municipal and regional level. Similar land uses are grouped into "paint palettes" representing different land use types and densities. Using a laptop computer and stylus driven monitor, users apply the paint palettes to parcels or land use polygons within their community. The software calculates total population, households, and jobs based on an allocation. A version of the model is available with three-dimensional representation capabilities.

PLACE³S The PLACE³S model (Planning for Community Energy, Environmental, and Economic Sustainability) is a GIS-based analytical tool to support community land use and transportation planning. Using parcel or polygon level information on existing and/or future land use, the model calculates a range of community indicators including vehicle-travel, return on investment, housing type mix, land consumption, energy consumption, and other environmental impacts. I-PLACE³s is a variation, which can be run over the Internet. PLACE³S software is in the public domain.

Rural Traffic Shed Model The rural traffic shed model is a method for allocating development permits based on the capacity of the roadway system. It is most applicable where there is a general flow of traffic towards an urban center. The method requires dividing a rural area into "traffic sheds" based on land served by various collectors and arterials. Trip generation rates associated with various land uses are applied to estimate traffic volumes and compare future volumes to roadway capacity with a given amount of development. The method includes a market-based system for phasing development concurrent with roadway improvements.

Smart Growth Index Smart Growth Index is a sketch-planning transportation, land use, and community impact model. The model utilizes parcel or polygon level land use data along with street centerlines and transit routes. Users define an analysis area, select indicators to be measured, assemble GIS data, prepare and evaluate a baseline scenario, prepare and evaluate alternative scenarios, and compare the scenarios. In addition to computing indicators, a forecasting module allows future land use patterns to be forecast based on transportation network accessibility measures.

Space Syntax/Ped-GRiD Space Syntax and Ped-GRiD (Pedestrian Geographic Resources Information Database) are GIS-based modeling techniques to identify urban locations that have a potential to increase pedestrian use, based on location of pedestrian-oriented land uses and other facilities. The methods use available or readily obtainable data including census data, street networks, major trip generators, and pedestrian count samples to predict pedestrian volumes throughout a city.

CommunityViz

Scale of Application: State/regional planning, site planning and development

Possible Implementing Agencies: MPO/RPC, City/County

Examples:

- **Fort Collins (Colorado) MPO**

The North Front Range Transportation and Air Quality Planning Council (NFRT&AQPC) is using CommunityViz to develop and compare alternative future land use scenarios and their impacts on the transportation system. Starting with baseline land use and environmental data for area communities, CommunityViz is being used in consultation with local officials to allocate forecast development. The model is being used as part of the "Envision the North Front Range" project and will be used to inform the next long-range transportation plan update. Contact: Cliff Davidson, NFRT&AQPC (970-416-2257).

- **Randolph (Vermont) RPC and Town of Randolph**

The Two Rivers-Ottawaquechee Regional Commission and the Town of Randolph used the CommunityViz model, including its SiteBuilder 3-D visualization software component, to examine development options for a freeway interchange. The design and placement of a welcome center and a park-and-ride facility were examined by a steering

committee of local stakeholders, and the results presented to the Randolph public. The committee and TRORC are working to implement the preferred interchange scenario by revising zoning, developing an access management plan for the state road traversing the interchange, working with the Vermont DOT to design and build a park-and-ride facility; and developing land conservation strategies for parcels with sensitive viewsheds. Contact: TRORC (802-457-3188).

- **City of Longmont (Colorado)**

The City of Longmont used CommunityViz software to help plan the St. Vrain Greenway pedestrian path connecting the city with a newly developed community and district park located on the edge of the city. Use of the CommunityViz software helped the Master Plan Committee conduct a comprehensive analysis of the social, economic and environmental sensitivities. Citizens and stakeholders were able to compare alternatives through predictive models. The effort resulted in the plan for a 6.5-mile greenway corridor that was widely supported by neighbors and the community. Contact: Paula Fitzgerald, City of Longmont (303-651-8448).

- **City of St. George (Utah)**

The City of St. George, faced with tremendous growth, used the CommunityViz software to compare the outcomes of a current growth plan against an alternative that included “smart growth” concepts. The software was particularly useful for comparing the impacts that each scenario would have on public service costs, energy costs, walkability, and vehicle miles traveled, in addition to many other measures. The technology allowed the project team to work interactively during meetings so that members could see the impacts of decisions instantly and three dimensionally. The CommunityViz software illustrated to the community of St. George that increasing the density of residential areas would create a transit-friendly area that would support a bus system and reduce travel time and expenses for residents.

Other References:

- CommunityViz software

CorPlan

Scale of Application: State/regional planning

Possible Implementing Agencies: MPO/RPC, City/County

Examples:

- **Binghamton (New York) MPO**

The Binghamton Metropolitan Transportation Study (BMTS) used CorPlan as part of a regional visioning and scenario planning process. *See: Full project description under “Regional Visioning and Scenario Planning.”* [Link To: Previous project reference]

- **Charlottesville (Virginia) MPO**

The Thomas Jefferson District Planning Commission (TJPDPC) used CorPlan to develop and model alternative regional land use scenarios as part of the Eastern Planning Initiative, a public visioning process. Three growth concepts were created through public workshops: core, nodal, and dispersed. The results were modeled to show differences in transportation and other impacts for each alternative. Contact Harrison Rue, TJPDPC (434-979-7310). See also FHWA: Land Use and Transportation Modeling Tools - CorPlan Model, TCSP Case Study #5.

Other References:

CorPlan Model -Contact: Chris Sinclair, Renaissance Planning Group, 407-487-0061.

GIS Environmental Mapping/Analysis

Scale of Application: State/regional planning, corridor/sub area planning, transportation project development, local comprehensive planning

Possible Implementing Agencies: State DOT, MPO/RPC, City/Count, Transit Agency, Other (nonprofit)

Examples:

- **Tucson (Arizona) MPO**

Through its Regional Remote Sensing project, the Pima Association of Governments (PAG) has collected high-resolution digital imagery for use in transportation and land use planning by regional and local agencies. Since 1998, the region has invested \$3.6 million collecting high-resolution imagery with sub-meter accuracy. The data are being used in transportation corridor studies, preliminary roadway design, hydrology and watershed analysis, floodplain mapping, land use planning, zoning code enforcement, and other applications in the public and private sectors. The data are maintained by PAG on a web-based Regional Data Center. Contact: Andrew Gunning, PAG (520-792-1093). See the Tucson, AZ: Orthophoto Case Study.

- **Riverside County (California)**

GIS has helped Riverside County use data on high-priority conservation areas, identified through a multi-species habitat planning effort, to select transportation corridors that reduce ecological impacts by avoiding sensitive areas or minimizing fragmentation of these areas. The process has made use of a comprehensive biological and physical database that includes information on vegetation, species occurrences, wetlands, topography, soils, and aerial photography. Outcomes of the project have included adoption of an updated general plan and a Multi-Species Habitat Conservation Plan, which will lead to the protection of 153,000 acres. Contact: Cathy Bechtel, RCTC (951-787-7141).

- **Conservation Research Institute, McHenry County (Illinois)**

Stakeholders in suburban McHenry County used GIS to help develop a sustainable transportation and land use plan for a developing arterial road corridor. Environmental GIS data were used to map suitable ecological habitat for five indicator species. A build-out analysis was performed based on planned densities and land uses. GIS was then used to create alternative land use plans and identify transportation facility alignments that would minimize impacts on these ecologically-sensitive areas. With the support of the U.S. Environmental Protection Agency and local jurisdictions, representative codes and ordinances are being developed to support the conservation approach recommended in the study. Contact: David Yocca, Conservation Design Forum (630-559-2002). *See also: Room for Growth, Room for Open Space (Conservation Research Institute, 2002).*

Other References:

- Federal Highway Administration. Case Studies in GIS. These case studies include examples of the use of GIS for environmental analysis in the selection of roadway alignments in North Carolina and San Diego, California.
- Federal Highway Administration. GIS in Transportation web site. This web site features numerous examples of the use of GIS in transportation planning and project development, including use of GIS to consider land use and environmental factors.
- Shenandoah Mountain Geographics, Inc. (2003). *The Use of Imagery in Transportation Planning: A Guidebook*. Washington, D.C. Published with technical support from the U.S. Department of Transportation, this guidebook presents key concepts in remote sensing, offers examples of the use of imagery in activities supporting transportation planning, and provides information about integrating the imagery and the derived products from geographic information systems.

MetroQuest

Scale of Application: State/regional planning, local comprehensive planning

Possible Implementing Agencies: State DOT, MPO/RPC, City/County

Examples:

- **Idaho Transportation Department**

The Idaho Transportation Department (ITD) used MetroQuest in a two-year, scenario-based planning process to support the creation of a statewide transportation vision. Idaho's Transportation Future: Getting There Together was a process that engaged more than 750 people between 2002 and 2004. MetroQuest was used in a three-day workshop to create and visualize scenarios and evaluate the results using a suite of performance measures. The result of the process was a comprehensive Vision Statement for the movement of people, materials, products, and information based on statewide

transportation system partners' values and priorities. Contact: Matthew Moore, ITD (208-334-8201).

- **Municipality of Whistler (British Columbia)**

The Resort Municipality of Whistler used MetroQuest to support the development of a Comprehensive Sustainability Plan. The tool was applied in a highly participatory and collaborative process to consider alternative development scenarios for the city. The preferred scenario became the official plan for the municipality and implementation is now underway. The plan includes recommended actions for transportation as well as 15 other strategy categories. Contact: Mike Vance, Resort Municipality of Whistler (614-935-8118).

Other References:

- MetroQuest software – Contact Dave Biggs, Envision Sustainability Tools (604-225-2010).
- Presentation at the 2005 Association of Metropolitan Planning Organizations (AMPO) Annual Conference.

Paint the Town/Paint the Region

Scale of Application: State/regional planning, local comprehensive planning

Possible Implementing Agencies: MPO/RPC, City/County

Examples:

- **Chicago (Illinois) MPO**

The Northeastern Illinois Planning Commission (NIPC) used Paint the Town in the Chicago area to develop demographic forecasts for 277 municipalities. Meetings lasting between one-half hour and four hours each were held with municipal elected officials and staff to identify areas where development was expected by 2030, and what type of development was expected. During the meetings, plans were reworked or alternative scenarios created based on estimate of total population, households, and jobs from the current scenario and a comparison to established forecasts for the community. Contact: Jack Pfingston, NIPC (312-454-0400).

- **Kansas City (Missouri) MPO**

The Mid-America Regional Council (MARC) is using the Paint the Town tool to develop long-range land use forecasts for use in transportation planning. To support this effort, the agency assembled parcel-level existing land use data from counties and cities in the region and worked with local governments to aggregate their land use plans into a consistent planned land use map. Due to the fact that cities in the region plan for ultimate build-out while the long-range transportation plan requires forecasts for a definite horizon year, some method of staging the forecast of development was required. MARC applied a development suitability score to each vacant parcel throughout the

town. Potential growth was allocated to parcels, and this information was added to the Paint the Town tool. As of 2005, the agency is completing a baseline forecast. In 2006, MARC will use Paint the Town, in conjunction with post-processing tools, to examine the public infrastructure cost implications of alternative regional growth scenarios to inform the development of the next long-range transportation plan. Contact: Frank Lenk, MARC (816-474-4240).

Other References:

- Paint the Town software - Contact Eliot Allen, Criterion Engineers/Planners (503-224-8606).

PLACE³S

The PLACE³S model (Planning for Community Energy, Environmental, and Economic Sustainability) is a GIS-based analytical tool to support community land use and transportation planning. Using parcel or polygon level information on existing and/or future land use, the model calculates a range of community indicators including vehicle-travel, return on investment, housing type mix, land consumption, energy consumption, and other environmental impacts. I-PLACE³s is a variation, which can be run over the Internet. PLACE³S software is in the public domain.

Scale of Application: State/regional planning, corridor/sub area planning

Possible Implementing Agencies: MPO/RPC, City/County

Examples:

- **Sacramento (California) MPO**

The Sacramento Area Council of Governments (SACOG) used I-PLACE³s in conjunction with a regional land use model and travel demand model enhancements to provide real-time feedback in public workshops on the effects of different land use options on transportation, open space, and other conditions. The model was used to support the Sacramento Blueprint regional planning and visioning project. For more information, see the Sacramento, CA: Blueprint Sacramento case study.

- **City of San Diego (California)**

Community stakeholders used PLACE³S to assess the impacts of alternative zoning and redevelopment plans for the Mid-City neighborhood in San Diego. A unique feature of the application was an economic impact model, which shows the viability of new development on each parcel in the study area given existing zoning constraints, development costs, and market conditions. Contact: Nancy Hanson, California Energy Commission (916-654-3948). See also TCSP Case Study #6.

Other References:

- PLACE³S homepage (California Energy Commission)

Rural Traffic Shed Model

Scale of Application: Local comprehensive planning

Possible Implementing Agencies: MPO/RPC, City/County

Examples:

- **Little Rock (Arkansas) MPO**

Using a similar approach to that taken in Williamson County, Tennessee, a Rural Traffic Shed Model was developed by METROPLAN, the MPO for Little Rock, and applied on a pilot basis to the rural portions of Pulaski and Saline Counties. A set of sample regulations was developed for each county consistent with the traffic-shed analysis. Contact: Richard Magee, METROPLAN Director of Planning (501-372-3300).

- **Williamson County (Tennessee)**

A traffic shed-based approach is being used as a regulatory tool in Williamson County to allocate development capacity using a market-based approach. The approach has allowed the county to achieve a high rate of growth while generally maintaining its rural character outside the fringes of urban areas. The approach has also generally kept traffic volumes in balance with the capacity of county roadways. See also: Kendig, Lane (1999). *Traffic Sheds, Rural Highway Capacity, and Growth Management*. Planners Advisory Service Report 485, American Planning Association, Chicago, IL. Tocknell, Steven (2002). *Traffic Sheds in Williamson County, Tennessee*. Presented at the 2002 American Planning Association National Planning Conference, Chicago, IL.

Smart Growth Index

Scale of Application: State/regional planning, corridor/sub area planning, local comprehensive planning, site planning and development

Possible Implementing Agencies: MPO/RPC, City/County, Transit Agency

Examples:

- **Wilmington (Delaware) MPO**

The Wilmington Area Planning Commission (WILMAPCO) used SGI to evaluate alternative brownfield redevelopment scenarios and a TOD development. A "base condition" focused on a vacant property targeted by the city and state for future economic development activity, while alternative scenarios tested a variety of options at each site, including high-density residential, intense commercial, and industrial. SGI is also being applied in "forecast" mode to model the impacts of the long-range transportation plan. Contact: Dan Blevins, WILMAPCO (302-737-6205 ext. 21).

- **Charleston (South Carolina) MPO**

The Berkeley-Charleston-Dorchester Council of Governments used SGI to project future growth patterns for this three-county area, based on current policies and planned infrastructure improvements. The council then examined the environmental quality and

transportation capacity impacts of each scenario. The information is being used to aid regional discussions concerning growth patterns. Contact: Haila Maze or Dan Hatley BCDCOG (843-529-0400).

- **San Antonio (Texas) transit agency and City of San Antonio**

San Antonio planning groups worked with a broad coalition of stakeholders to analyze future development opportunities in the Broadway corridor. SGI was used to analyze the impacts of a new development plan focusing on mixed-use, reuse, and transit-oriented development, and compared these impacts to existing conditions and conditions expected under existing plans. Contact: Manjiri Akalkotkar, VIA Transit (210-362-2092).

- **Burlington (Vermont) MPO**

The Chittenden County MPO (CCMPO) used an adaptation of SGI to create a land use decision support system. A "snapshot" module uses a set of indicators to benchmark existing conditions, evaluate alternative courses of action, and monitor change over time. A "forecast" module predicts the location of future housing and employment based on transportation accessibility and local land use policies. The CCMPO is disseminating the Snapshot software to other planning entities and local municipalities to support their planning efforts and to help them better understand the relationship between transportation and land use. Contact: David Roberts, CCMPO (802-660-4071)

Other References:

- Smart Growth Index model (U.S. Environmental Protection Agency) Contact: Eric Sprague (202-566-2861).

Space Syntax/Ped-GRiD

Scale of Application: State/regional planning, corridor/sub area planning

Possible Implementing Agencies: MPO/RPC, City/County

Examples:

- **City of Oakland (California)**

The City of Oakland applied Space Syntax methods to identify locations with a high pedestrian demand and a low supply of facilities, based on locations of population and employment, trip generators, and pedestrian facilities. The maps also showed locations of pedestrian/vehicle collisions. The city also solicited community input to identify areas avoided by pedestrians. The results were used to help the city develop the Oakland Pedestrian Master Plan adopted in November 2002. Contact: Zach Wald, City of Oakland (510-238-7013). Oakland, CA: Pedestrian Plan.

- **Southern California MPO**

The Southern California Association of Governments (SCAG) used a GIS application known as Ped-GRiD, based on Space Syntax principles, to develop a non-motorized

transportation plan that established a regional framework of locations with the best potential for pedestrian activities. Planners analyzed the locations of pedestrian-oriented land uses, bicycle and multi-modal transportation nodes, and bicycle and pedestrian routes, and used this information to determine where to allocate funds for improvements. Contact: Joe Carreras, SCAG Department of Planning and Policy (213-236-1856).

Other References:

- Local Government Commission. "Geographic Information Systems: A Tool for Improving Community Livability."
- Rafor, Noah, and David R. Ragland (August 2003). "Space Syntax: An Innovative Pedestrian Volume Modeling Tool for Pedestrian Safety." U.C. Berkeley Traffic Safety Center, paper UCB-TSC-RR-2003-11.
- Space Syntax has been more widely applied in Europe.

Project Prioritization and Funding:

State Fiscal and Regulatory Incentives State agencies have provided incentives, including prioritization of capital funds and regulatory streamlining/ expedited permitting, for jurisdictions adopting policies and implementing projects that support "smart growth" or other development principles such as enhancing walkability, pedestrian friendliness, and transit-oriented site design in urban neighborhoods. Examples of participating state agencies include departments of transportation, housing, economic development, community development, and environmental protection.

Project Screening and Selection Criteria MPOs have adopted transportation project selection criteria for the long-range transportation plan (LRTP) or transportation improvement program (TIP) that consider "smart growth" criteria, consistency with a state or regional land use plan or vision, and/or other land use objectives/criteria.

Funding for Streetscape, Urban Design, and Multi-modal Improvements State and regional agencies have used Federal transportation funds and other state and local sources to implement state capital improvements and fund local capital improvements that enhance walkability, pedestrian friendliness, and transit-oriented site design in urban neighborhoods. In many cases, the funds are provided as "implementation" grants to communities that have already undertaken state or regionally funded planning activities for a specific area.

Transit Corridor and Station Area Development Programs State DOTs, MPOs, transit agencies, and cities have provided technical assistance, financial assistance, and outreach to promote transit-supportive development in transit station areas and corridors. These comprehensive station area development programs have been aimed at addressing all of the various barriers to achieving transit supportive development in existing or planned station areas.

Funding for Streetscape, Urban Design, and Multi-modal Improvements

Scale of Application: State/regional planning, transportation project development, site planning and development

Possible Implementing Agencies: State DOT, MPO/RPC, City/County, Transit Agency

Examples:

- **San Francisco (California) MPO**

Since 1998, the Metropolitan Transportation Commission's (MTC) Transportation for Livable Communities program has provided planning and capital improvement grants for town centers, public transit hubs, key streets and other improvements designed to foster community vitality. The Housing Incentive Program provides additional funding for streetscape, pedestrian, bicycle, and other infrastructure improvements for communities building housing within 1/3 mile of rapid transit stations. Between 1998 and 2003, the programs funded \$2.2 million in planning grants and over \$54 million in capital grants and housing incentives. Funding has come from Federal sources including STP, CMAQ, and Transportation Enhancements, as well as from the State Transportation Development Act. Contact: Evelyn Baker, MTC (510-464-7753).

- **Minneapolis-St. Paul (Minnesota) MPO**

The Livable Communities Grant Program, established by the Minnesota legislature in 1995, has provided grants to communities in the Minneapolis-St. Paul metropolitan area to develop plans and implement mixed-use, walkable neighborhoods, brownfields cleanup, and affordable housing projects. Administered by the Metropolitan Council, the program has provided over \$128 million in funding and is expected to leverage over \$3 billion in private investment. Contact: Jan Gustafson, Metropolitan Council (651-602-1384).

- **New Jersey Transit**

The Transit-Friendly Planning Assistance Program provides technical assistance to willing communities through on-call consultants with expertise in transportation planning, urban design, market analysis, economic development, downtown revitalization and community outreach. The program has resulted in the creation of several consensus-based, transit supportive land use “vision plans” communities are using to guide development at and around surrounding existing or proposed transit facilities. Contact: Vivian Baker, New Jersey Transit (973-491-7822).

- **Dallas (Texas) MPO**

Through the Land Use-Transportation Joint Venture Program, the North Central Texas Council of Governments (NCTCOG) provided \$41 million in STP and CMAQ funds between 2002 and 2004 for 19 transportation improvements (such as pedestrian and bicycle improvements) supporting transit-oriented developments, mixed-use, urban developments, and infill developments. Federal funds were matched with local, private

sector funds, local/city funds, tax increment financing district funds, and right-of-way land donations. Due to the success of the first call for projects, NCTCOG issued a second \$40 million Sustainable Development call in October 2005. In addition to transportation infrastructure improvements, funds are available for land banking and local sustainable development planning programs. NCTCOG reports that as a result of the first call for projects and in anticipation of the second call, many local governments have updated or changed their zoning to include classifications that will allow mixed-use sustainable development projects to be built by right. In addition, NCTCOG is “trading” local for federal dollars to streamline and quicken implementation of small infrastructure projects that support development. Contact: Alicia Hopkins, NCTCOG (817-608-2380).

- **Massachusetts Executive Office of Transportation**

The 2004 Massachusetts’ Transportation Bond Bill directed the Office for Commonwealth Development (OCD) to create a Transit-Oriented Development Infrastructure and Housing Support Program, to be administered through the Executive Office of Transportation (EOT). The program is providing \$30 million in financial assistance to public agencies for pedestrian improvements, bicycle facilities, housing projects, and parking facilities in mixed-use developments located within one-quarter mile of a transit station. EOT is collaborating with the Department of Housing and Economic Development (DHED) on implementing the housing component of this program. To ensure that projects support TOD principles, OCD, in consultation with EOT and DHED, established specific evaluation criteria for each of the four project types. Contact: Jane Healey, OCD (617-573-1388).

Project Screening/Selection Criteria

Scale of Application: State/regional planning

Possible Implementing Agencies: State DOT, MPO/RPC

Examples:

- **Denver (Colorado) MPO**

The Denver Regional Council of Governments’ (DRCOG) selection criteria for local projects in the 2005-2010 TIP include up to 16 points (out of 100) for various, specified local actions supporting the regional Metro Vision. Points are awarded for a variety of criteria including signing the regional Mile High Compact, protecting open space, approving infill and mixed use development plans, adopting zoning changes, completing major streetscape projects, and building multi-family housing.

- **Wilmington (Delaware) MPO**

In the late 1990s, the Wilmington Area Planning Commission (WILMAPCO) designated “Transportation Investment Areas” in the Wilmington region, including Center, Community, Development, and Rural areas. The agency has used these areas in the

screening of projects for the LRTP to ensure that projects are appropriate to their respective area. WILMAPCO reports that a primary application of the policy has been to identify urban centers in which pedestrian and bicycle facilities should be included along with roadway improvements. Contact: Heather Dunigan, Principal Planner (302-737-6205).

- **Maryland State agencies, including DOT**

Since the late 1990s, the state of Maryland has used priority-funding areas to set criteria for state investments, including transportation investments by the Maryland Department of Transportation (MDOT). Priority Funding Areas are locations where the state and local governments want to target their efforts to encourage and support economic development and new growth. The criteria have led to the removal of bypass projects from MDOT's capital funding program, multi-modal improvements in urban areas, and the use of access control as a tool for locating development. Contact: Don Halligan, MDOT Transportation & Land Use Planning (410-865-1294).

- **Seattle (Washington) MPO**

The Puget Sound Regional Council's (PSRC) 2002 Regional TIP Policy Framework includes project selection criteria for consistency with Vision 2020, a regional transportation and land use vision adopted in 1990 and updated in 1995. Candidate TIP projects receive points for supporting designated urban centers, manufacturing/industrial centers, and connecting corridors, with specific criteria including circulation/continuity, urban environment, mobility/accessibility, benefit to the center, and sustainability. See: Puget Sound Regional Council, "Regional Project Evaluation Criteria."

State Fiscal and Regulatory Incentives

Scale of Application: State/regional planning, corridor/sub area planning, transportation project development, local comprehensive planning, site planning and development

Possible Implementing Agencies: State DOT, other (State agency)

Examples:

- **New Jersey DOT**

The New Jersey DOT (NJDOT), as part of its Future in Transportation (FIT) Program, is prioritizing investment in communities that work with NJDOT and other state agencies on land use planning issues. NJDOT is providing support for planning studies in these communities (such as corridor studies) that address transportation and land use in tandem, and will give priority to projects in these communities. NJDOT's overall FIT program also includes context-sensitive design, network connectivity policies, balanced street design guidelines, and an emphasis on community involvement. Contact: Gary Toth, NJDOT (609-530-5262).

- **Oregon State agencies, including Oregon DOT**

The state of Oregon has developed an Integrated Investment Strategy to ensure that programs at five state agencies support growth management objectives and are consistent. A Community Solutions Team provides quick-response technical assistance to communities that have a transportation-related land use issue, for example, working with a major employer to stay downtown instead of moving to a greenfields location. For more information, see the Oregon (Statewide): Community Solutions Team case study.

- **Utah State agencies, including Utah DOT**

Under the Governor's Quality Growth Communities Program, four state agencies in Utah, including the Utah DOT (UDOT), are offering planning assistance and funding priority to jurisdictions that enact "smart growth" measures. Cities, towns, counties, special districts, transit authorities and other service providers are eligible for the program. To be eligible, entities must apply for designation as a "Quality Growth Community" or a "Quality Growth Service Provider." To become certified, a community must be engaged in an enhanced community planning process, including working closely with neighboring communities on areas of common concern. This program was initiated in January 2004. Contact: John Bennett, Governor's Office of Planning and Budget (801-538-1027).

Transit Corridor and Station Area Development Programs

Scale of Application: Site planning and development

Possible Implementing Agencies: State DOT, MPO/RPC, City/County, Transit Agency

Examples:

- **San Francisco (California) transit agency**

In 2002, the Bay Area Rapid Transit Authority (BART) adopted a new system expansion planning process and criteria that emphasize cost-effectiveness, ridership generation, multi-modal access, transit-oriented development, local partnerships, and the use of appropriate transit technologies. As part of the process, localities are encouraged to prepare a Ridership Development Plan that puts in place transit-supportive plans, zoning, infrastructure and services. Application of the new process has led to transit-supportive plans and zoning changes in several local jurisdictions. Jurisdictions not prepared to make the land use changes needed for a high project rating are encouraged to consider lower-cost transit alternatives. Contact: Ellen Smith, BART (510-287-4758).

- **Dallas-Fort Worth (Texas) transit agency**

The Dallas Area Rapid Transit's (DART) transit station Economic Development Program has helped stimulate high-density development around light rail transit stations. The program is targeted primarily at the development community, and its objective is to leverage transit-oriented development by providing information on available sites and

financial incentives for developers. Fact sheets include a detailed station area profile of each of the stations along DART's existing light rail lines and along planned future extensions. DART also organized Economic Development Summits at which members of the development community and the planning community could to share experiences, insights, and perspectives on developing projects near transit. Through 2005, approximately \$3.3 billion in new investment has occurred near DART stations. Contact: Cheri Bush, DART (214-749-2568).

- **City of Fort Worth (Texas)**

The City of Fort Worth has undertaken the development of community-based plans, fiscal incentives, and public investment to target growth to 10 "urban villages" along bus transit corridors. In each village, the city undertook a community-based charrette process to gain consensus among local stakeholders about appropriate types of development. The city is offering fiscal incentives to cover financing gaps for innovative projects that are potentially profitable but which lenders may not have enough confidence to finance. To date, approximately \$10 million in public-sector investment in infrastructure improvements and development incentives has leveraged \$112 million in private development that is now in the permitting or planning stages. The city has required developers applying for building permits and financial incentives to meet specific design criteria. As a result, proposed projects are pedestrian-oriented, mixed-use, and higher-density urban infill. Contact: Dana Burghdoff, City of Fort Worth (817-392-8018).

- **Florida DOT**

Florida DOT's (FDOT) District 5 office (Fort Lauderdale) has sponsored TOD planning and joint development activities to support new commuter rail in the region, a proposed light rail system, and other corridors and areas with high levels of transit service. The office has issued requests for proposals (RFPs) for large, underutilized park-and-ride lots with the intention of redeveloping them with high-density, mixed-use development and structured parking. For example, FDOT is working with a community developer at one station to construct seven-story apartments with 20 percent affordable units, a high school, police annex, and commercial and retail space. Contact: Jeff Weidner, FDOT District 5 (954-777-4670).

Design Guidelines and Standards:

Context-Sensitive Design/Solutions Context-Sensitive Design and Context-Sensitive Solutions (CSD/CSS) are a planning approach for transportation projects and facility design oriented toward meeting the needs of users, the community served, and the natural environment. CSD/CSS policies and practices can support local land use plans by ensuring that transportation facilities are compatible with a particular community land use pattern and urban or rural environment.

Local Road Design Guidelines Guidelines or standards developed for local streets that permit or specify widths, street geometry, utility placement, and provision of bicycle and pedestrian facilities that promote walkable, human-scaled communities. Through the Regional Transportation Plan, MPOs can work with member jurisdictions and state agencies to establish road network and facility design policies that support regional and local land use objectives, and to fund projects consistent with these design policies.

Access Management State and local agencies have worked to control access to properties along major roadways to improve traffic flow and safety. Access management principles include restricting uncontrolled driveway access onto major arterials, restricting left turns, providing internal connectivity among properties, and providing adequate "throat depth" on connecting streets to avoid traffic conflicts. Different levels of access management can be applied based on street classifications and/or area land use designations, to ensure that the principles applied are both consistent with the function of the transportation facility and respect the character of the land uses and neighborhood served.

Road Swaps and Transfers When a state highway also serves as the main street of a traditional downtown, state agency design requirements or needs related to through traffic movement may conflict with local economic development objectives that require calming traffic and creating a more pedestrian-friendly environment. Rather than expanding capacity on downtown arterials, state and local agencies have worked to identify alternative through routes for traffic, and in some cases have transferred or swapped jurisdiction to allow both local and state objectives to be achieved.

Pedestrian and Bicycle Facilities Design Guidelines/Programs State DOTs and MPOs have provided assistance to county and city governments to develop and implement pedestrian and bicycle facility improvement plans. This assistance may include guidance on land use and site design to support pedestrian, bicycle, and transit access.

Model Zoning and Subdivision Ordinances State agencies, MPOs, professional groups, and nonprofits have created model ordinances for transit-oriented development, traditional neighborhood development, or other growth patterns that improve transportation-land use integration. These ordinances are designed to be modified and adopted by local jurisdictions that may not have the resources to research and write their own ordinance from scratch.

Access Management

Scale of Application: Corridor/sub area planning, transportation project development, site planning and development

Possible Implementing Agencies: State DOT, City/County

Examples:

- **Martin County (Florida)**

Martin County, Florida's Roadway Design Ordinance (no. 561) includes a section on access management addressing the access classification of the roadway and related

intersection spacing standards, corner clearance, access among properties, driveway spacing and design, and overlay zones. The ordinance also includes sections on mobility and connectivity, with the intent of discouraging the use of local streets for cut-through traffic while maintaining the overall connectivity of the roadway system for vehicle traffic, bicyclists, and pedestrians.

- **Vermont AOT**

The Vermont Agency of Transportation (VTrans) first published its Access Management Program Guidelines in 1999. In 2004 and 2005, VTrans updated these guidelines, undertook a significant outreach program, and developed a comprehensive web site; as a result, the agency notes significant interest from developers, consultants, and municipalities (including an average of 22 visitors and 94 hits a day to the web site). The guidelines establish a six-level access classification system and associated standards in order to ensure consistency in the access permitting process for the State Highway System. Standards cover criteria for granting direct accesses and for allowing right and left turns, spacing of accesses that are or may become signalized, and separation of opposing traffic movements. Criteria for granting access permits include consistency with state land use goals, state agency plans, and regional and local land use plans. Contact: Craig Keller, VTrans (802-828-2485); or Kim Murray, VTrans (802-828-2629).

Other References:

- The Transportation Research Board's Access Management web site contains numerous resources on access management, including an introduction to access management principles, guides and handbooks, research on benefits and impacts, and model codes and ordinances developed by state and local agencies.
- National Cooperative Highway Research Program (NCHRP) Report 548: A Guidebook for Including Access Management in Transportation Planning offers guidance for implementing access management through the transportation planning process.

Context-Sensitive Design/Solutions

Scale of Application: Transportation project development

Possible Implementing Agencies: State DOT, City/County

Examples:

- **California Department of Transportation**

The California Department of Transportation's (Caltrans) Context-Sensitive Solutions (CSS) Program includes a \$2.5 million task order contract to provide on-call support services to support community outreach statewide and encourage early public participation. As of 2004, 49 task orders have been funded supporting planning and public involvement activities throughout the state. These have included studies on land use, such as the San Joaquin Growth Response Study, in which Caltrans is assisting the Fresno metropolitan area with the development of a process and tools to link planning

for transportation, land use, the environment, and the economy. Also in the San Joaquin Valley, Caltrans developed the Route 99 Corridor Enhancement Master Plan to strengthen community identity, unify freeway improvements, and develop design concepts that tie communities through the valley together and foster a valley-wide identity. Other CSS implementation activities have included adoption of official agency policy, statewide training for Caltrans and local agency staff, a highway design manual philosophy statement, a project development procedures manual philosophy statement, a stakeholder involvement communication handbook for project managers, several best practices public participation guides, a booklet on livability concepts for design and operations of main streets, and CSS project case studies. Contact: Carolyn Dudley, Caltrans (916-654-5505).

- **Minnesota DOT**

The Minnesota DOT (Mn/DOT) has adopted a policy on CSD and has sponsored one-day workshop for engineers, managers, planners, landscape architects and other local government professionals who are involved in transportation project development. The Workshop Participant Manual includes case studies.

- **New Jersey DOT**

The New Jersey DOT (NJDOT) formally incorporated CSD into its procedures in 1999 and since then has conducted a series of statewide trainings in context-sensitive design reaching over 600 DOT staff, local agency staff, and consultants. The trainings address community place-making, engineering and liability issues, consensus-building and community participation, and conflict resolution and negotiation. Contact: Dick Dunn, NJDOT Chief of Design (609-530-2733).

- **New York State DOT**

The New York State DOT (NYSDOT) has implemented CSS since 1999 through an implementation plan, engineering instructions, and providing other tools and training. The department gives annual awards for exemplary projects, and highlights these projects on its web site. Nearly 40 projects from each region of the state have been highlighted since the award program began in 2000.

- **Vermont AOT**

In 1997, the Vermont Agency of Transportation (VTrans) adopted a set of revised state highway design standards. The standards were designed to be flexible and to allow and encourage creative methods to minimize impacts on scenic, historic, archaeological, environmental and other important resources. Contextual and situational issues for each project are identified early in the design process, before geometric values are selected. VTrans is applying the flexibility in its standards to reduce the community impacts of improvements to National Highway System roads through small towns such as Danville and Brandon. A key to Vermont's success in implementing these standards

was their adoption into law by the state. Contact: Bob Shattuck, VTrans Chief of Design (802-828-2664).

Other References:

- Maryland State Highway Administration (revised 2003). *When Main Street is a State Highway: Blending Beauty, Function, and Identity*. This document discusses not only design principles but also a community-based planning and project development process to integrate land use, transportation, and economic development. The Main Street process has been applied in over 120 roadway projects.
- Many other states have adopted or are in the process of adopting CSD/CSS policies and practices. The FHWA CSD/CSS Web site provides general information on the subject.
- The National Transit Institute offers a three-day course for transportation professionals and others entitled *Context-Sensitive Solutions in a Multi-Modal Environment*.

Local Road Design Guidelines

Scale of Application: State/regional planning, corridor/sub area planning, transportation project development, local comprehensive planning, site planning and development

Possible Implementing Agencies: State DOT, MPO/RPC, City/County

Examples:

- **City of Denver (Colorado)**

In Denver, a new street classification system considers multiple modes and surrounding land uses. Multi-modal streets are zoned as residential streets, main streets, mixed-use streets, commercial streets, industrial streets, landmark streets, and one-way couplets. For more information, see the [link to new file: Denver, CO: Street Classification System] case study.

- **Delaware DOT and Wilmington MPO**

Through its "Mobility-Friendly Design Standards" program, the Wilmington Area Planning Commission (WILMAPCO) has funded changes to local street design standards in comprehensive plans to allow the creation of more walkable and transit-friendly communities. Alternative design standards have been adopted in Cecil County, Middletown, and Chesapeake City that can be applied at the developer's option. Contact: Heather Dunigan, WILMAPCO (302-737-6205).

- **City of Charlotte (North Carolina)**

Charlotte has revised its Urban Street Design Guidelines to support new development and redevelopment goals for the city. The guidelines apply to new construction or reconstruction of major streets as well as local streets. Major street typologies include Main Street, Avenue, Boulevard, and Parkway, reflecting various levels of automobile vs. pedestrian design priority. The guidelines allow the city to design streets appropriate to different types of neighborhoods including traditional downtowns,

transit-oriented developments, urban residential and mixed-use, and suburban areas. The guidelines are already being applied in locations such as existing and proposed transit stations along the South Corridor light rail corridor. Contact: Norm Steinman, City of Charlotte Division Manager (704-336-3939) or Tracy Newsome, City of Charlotte Transportation Planner (704-353-0778).

- **North Carolina DOT**

In 2000, the North Carolina Department of Transportation (NCDOT) developed Traditional Neighborhood Development Street Design Guidelines (PDF only). These guidelines are intended as a tool for NCDOT personnel for reviewing proposed Traditional Neighborhood Developments (TNDs). They are intended to supersede the department's existing standards for subdivision roads for these types of developments. The guidelines include review criteria for NCDOT district engineers that address not only the design of the roadway itself but also street network connectivity, pedestrian accommodations, interface with state highways, and the orientation of buildings. Contact: Steve Varnedoe, Chief Engineer, NCDOT (919-733-7621).

- **Portland (Oregon) MPO**

Portland Metro's 2000 Regional Transportation Plan and 2004 Update includes street spacing standards that support the Region 2040 Growth Concept, adopted in 1995. The standards rely on provision of a well-connected local street network to support regional growth and land use objectives of ensuring that centers and neighborhoods are walkable and pedestrian-friendly. The plan also includes design guidelines for arterial and collector streets to improve access and safety for pedestrians, bicyclists and transit users. A hierarchy of streets is defined, including throughways, boulevards, streets, and roads, with different modal and functional service objectives, and typical cross-sections are provided for each type of street. Metro's Livable Streets Program has produced three handbooks that provide additional guidance for implementing these regional policies. All the handbooks include detailed illustrations and photographs of street designs that successfully integrate streets with nearby land uses to enhance safety and promote community livability. One handbook addresses innovative storm water management strategies. Contact: Kim Ellis, Metro (503-797-1617). See also: Metro's Street Design Web Site.

- **Charlottesville (Virginia) RPC**

The Thomas Jefferson District Planning Commission (TJPDC), with support from the Virginia DOT, has developed a "Design Manual for Small Towns." The manual is intended for small towns and city neighborhoods coping with traffic problems such as congestion, pedestrian and bicycle safety, speeding traffic, through truck traffic, street noise, and inadequate parking. It is written in a problem-solution format and includes land use as well as engineering and design solutions. TJPDC reports that the manual has become a standard document in small communities' plans, and that its "problem-

solution” format has been especially useful. Contact: Bill Wanner, TJPDC (434-979-7310).

Other References:

- *Neighborhood Street Design Guidelines: An ITE Proposed Recommended Practice*. Institute of Transportation Engineers, 2003. This document provides guidance in the overall layout and design of transportation elements for new neighborhood developments, where neighborhoods can comprise both residential and mixed residential/commercial subdivision development.
- Burden, Daniel. *Street Design Guidelines for Healthy Neighborhoods*. Local Government Commission, 1999. This 52-page guidebook helps communities implement designs for streets that are safe, efficient and aesthetically pleasing for both people and cars.
- Portland Metro (2003). *Creating Livable Streets: Street Design Guidelines for 2040*. This handbook describes general guidelines to consider when designing new streets or upgrading existing streets in any community. The handbook also includes detailed illustrations and photographs of street designs that successfully integrate streets with nearby land uses to enhance safety and promote community livability.

Model Ordinances

Scale of Application: Local comprehensive planning, site planning and development

Possible Implementing Agencies: MPO/RPC, State, Other (nonprofit)

Examples:

- **Nonprofits in California's San Joaquin Valley**

In California's San Joaquin Valley, the Growth Alternatives Alliance - a unique partnership of local governments, the building industry, business alliances, farming organizations, and non-profit groups - and the Local Government Commission developed a set of model Smart Growth Zoning Codes and introduced numerous San Joaquin Valley communities to these codes. Jurisdictions are taking action to incorporate the principles of these codes into their own plans and regulations. For example, the city of Fresno has completed their general plan update and has budgeted for the revision of their zoning ordinance in 2004. The City of Lemoore has placed all unentitled land under Planned Unit Development (PUD) zoning subject to traditional neighborhood development guidelines. Contact: Josh Meyer, Local Government Commission (916-448-1198) or Dave Mitchell, San Joaquin Valley Air Pollution Control District (559-230-5807).

- **Columbus (Ohio) MPO**

The Mid-Ohio Regional Planning Commission (MORPC) developed a model transit-oriented development zoning overlay district ordinance for local jurisdictions. The model ordinance is intended as a starting point that communities can modify to reflect local priorities. The model ordinance identifies permitted and restricted uses, minimum

and maximum densities, parking requirements, and standards for building placement, design, and orientation. Contact: Chris Gawronski, MORPC (614-233-4166).

Other References:

- *Growing Smart Legislative Guidebook: Model Statutes for Planning and the Management of Change.* American Planning Association: Chicago, IL, 2002. This guidebook is a compilation of model policies, regulations, and tools to implement Smart Growth practices from throughout the United States.
- *Smart Growth Zoning Codes: A Resource Guide.* Local Government Commission. Based on research of more than 150 smart growth zoning codes from across the nation, this guidebook helps planners design a zoning code that encourages the construction of walkable, mixed use neighborhoods and the revitalization of existing places.
- Morris, Marya, ed. (1997). *Creating Transit-Supportive Land Use Regulations*. This collection of codes, standards, and designs addresses topics including transit and pedestrian-friendly site design, parking, mixed-use development, densities, and incentives. Planners Advisory Service Report 468, American Planning Association: Chicago, IL.

Pedestrian and Bicycle Facilities Design Guidelines/Programs

Scale of Application: State/regional planning, corridor/sub area planning, transportation project development, site planning and development

Possible Implementing Agencies: State DOT, MPO, City/County

Examples:

- **City of Chicago**

The City of Chicago's Bike Lane Design Guide describes design guidelines for bicycle lanes and pavement markings appropriate for different types of streets and neighborhood contexts. The city is working to apply these design guidelines on streets throughout the city as part of the implementation of its overall bicycle program. The guide is being updated in 2006 to reflect current standards as well as new-shared lane pavement markings. Contact: Ben Gomberg, City of Chicago (312-744-8093).

- **Florida DOT**

Florida DOT's publication, "Walkable Communities: Twelve Steps for an Effective Program" summarizes key planning, zoning, engineering, and development strategies that can make communities more walkable. The document addresses walkway networks, pedestrian crossings, access management, auto- and parking-restricted zones, and walkable scale land use planning. Contact: Dwight Kingsbury, FDOT (850-245-1500).

- **Provo-Orem (Utah) MPO**

The Mountainland Association of Governments (MAG) in Orem, Utah has developed a primer on trail building that is intended to help interested groups navigate through the complex process of developing a non-motorized trail system. The primer includes a sample city non-motorized trail plan, including standards for trail construction, maintenance, and signage that can be adopted by a community. The MPO also has hired a full-time planner to work on bicycle and pedestrian issues. The planner assists the MPO's member governments in developing bicycle and pedestrian plans as well as implementing improvements as a matter of course when undertaking new road building, widening, and rehabilitation projects. MAG reports that state and local DOTs are now becoming more aware of and increasingly planning for bicycle and pedestrian needs. Contact: Jim Price, (801-229-3800).

- **Washington State DOT**

The Washington State DOT (WSDOT) developed a Pedestrian Facilities Guidebook that provides guidance for state and local staff on designing facilities for pedestrians. The guidebook includes a chapter on site design to support pedestrian travel. Contact: Paula Reeves, WSDOT (360-705-7258).

Other References:

- The Pedestrian and Bicycle Information Center contains numerous references on planning techniques, including land use strategies, to accommodate bicycle and pedestrian travel.
- The National Center for Bicycling and Walking includes bicycle and pedestrian facility guidelines and other resources.

Road Swaps and Transfers

Scale of Application: Corridor/sub area planning, transportation project development

Possible Implementing Agencies: State DOT, City/County

Examples:

- **City of Beacon Falls (Connecticut) and Connecticut DOT**

As a key component in a downtown redevelopment plan, the Town of Beacon Falls, Connecticut is taking ownership of its Main Street from the Connecticut DOT (ConnDOT). The transfer of ownership will allow the town to make improvements that the state cannot, such as to install park benches and trees along the right-of-way, in conjunction with the reconstruction and narrowing Main Street from four lanes to two lanes. This reduction in the number of lanes is possible because a freeway bypass of the town was completed in 1983, greatly reducing traffic through the town. Contact: Cathryn Faraci, ConnDOT Transportation Planner (860-594-2160) or James Woodward, Citizens for Tomorrow's Downtown (203-729-7409).

- **City of Delray Beach (Florida) and Florida DOT**

The City of Delray Beach has demonstrated its commitment to revitalization by simultaneously slowing traffic in key corridors and restoring aging and abandoned buildings within the heart of its downtown. In the early 1980s, the Florida DOT (FDOT) proposed the creation of a hurricane evacuation route on Atlantic Avenue, which would have resulted in a major highway running through the downtown. Delray Beach planning staff worked with FDOT to find an alternative to FDOT's proposal, and the city agreed to create a downtown bypass system by using two local streets that run parallel to Atlantic Avenue. The city also agreed to assume all maintenance responsibilities for Atlantic Avenue. Under the control of the city, the six-block stretch of Atlantic Avenue has been transformed into a pedestrian-friendly corridor lined with vibrant outdoor cafes, shops, and other smaller-scale businesses. See: *FHWA Land Use and Transportation Planning Coordination Domestic Scan Tour II, November 3-7, 2003, (PDF, 276KB)*.

- **City of Chattanooga (Tennessee) and Tennessee DOT**

In the mid 1980s, the City of Chattanooga made a commitment to reconnect its downtown to the Tennessee River as the keystone of its revitalization efforts. A crucial element of the city's plans has been the reconfiguration of the 7.2 mile, four lane, limited-access Riverfront Parkway that separates downtown from the river. The parkway is being reduced from four lanes to two lanes to slow traffic, making it more pedestrian friendly and increasing accessibility to the waterfront. The city worked with the Tennessee DOT to identify an alternate state route that bypasses downtown Chattanooga and connects to I-70, and can be used by freight carriers and other through traffic. See: *FHWA Land Use and Transportation Planning Coordination Domestic Scan Tour II, November 3-7, 2003, (PDF, 276KB)*



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